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THE INDICATIONS FOR BLOOD TRANSFUSION AND THE METHODS OF TESTING THE BLOOD OF DONORS.[1]

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IN a previous paper on surgical shock(1) reference was made to the use of blood transfusion in cases of shock hæmorrhage. To-night it is proposed to review briefly the general indications for its use, to indicate how much can be legitimately expected as a result of the operation and to refer to the notes of a few patients so treated to illustrate these indications.

Because of its dramatic success in saving lives in otherwise hopeless cases, aided probably by its sentimental appeal, there is a tendency to use the method indiscriminately as a forlorn hope to save life in patients for whom there is no justification for its employment.

The transfusion of blood is somewhat comparable to skin grafting, bone grafting and the like, in which living tissues are transferred from one individual—the donor—to another—the recipient; but there are actually fundamental points of difference.

(*i.*) In the transfusion of blood the new living cells are rapidly distributed throughout the body, producing general and far-reaching results.

(*ii.*) The transfused living corpuscles represent the finished product, as it were, of the blood-forming factories of the body and they do not contain within themselves the "mother" cells necessary for their own continued replacement, as does a successful skin graft. The significance of this will be apparent when we are considering the limitations to the advantages resulting from transfusing patients suffering from blood diseases or other conditions in which destruction of blood corpuscles is a marked feature of the disease. In such cases the basic underlying causation of the disease is quite unknown, *e.g.*, pernicious anæmia, leuchæmia, etc.. Any new corpuscles introduced into the circulation from a donor can be of only temporary benefit, as the cause of the disease is not directly affected thereby and the new corpuscles are probably destroyed even more rapidly than are those of the recipient himself.

The operation of blood transfusion became a practical procedure only after two difficulties were overcome:

(*i.*) The inevitable clotting which occurred during the operation, preventing its continuance.

(*ii.*) Incompatibility between the blood of different individuals, which is most apparently ex-

[1] Read at a meeting of the Victorian Branch of the British Medical Association on July 6, 1921.

pressed as agglutination and hæmolysis of one person's corpuscles by another person's serum. If these occur to anything like a marked degree, fatal results ensue. In Bernheim's series of eight hundred cases of transfusion, without previous blood testing, there were sixteen cases of hæmolysis with four deaths. In Crile's hundred cases there were two deaths from incompatibility.

The clotting difficulty was overcome by: (*a*) Physical means—by coating all materials used with paraffin or other similar substance; (*b*) chemical means—by the addition of solutions of certain salts, such as oxalates and citrates, which prevent clotting, by reason of the fact that they put out of action the calcium essential for clotting.

The details of these methods are to be deal with by others this evening and will therefore not be further discussed.

The incompatibility difficulty was solved by the work of Lindeman and Moss, who found that all individuals could be classified into four groups, according to the inter-reactions of their corpuscles and sera, expressed as hæmolysis or agglutination. These two always run parallel; agglutination is the one usually investigated, as being easier to carry out. The technique for determining the blood grouping of any individual will be demonstrated later.

Serum.	Corpuscles 1	2	3	4	
1	—	—	—	—	8%
2	+	—	+	—	40%
3	+	+	—	—	10%
4	+	+	+	—	42%

With these preliminary observations, let us now direct our attention more particularly to that portion of the subject allotted me—the indications for blood transfusion.

We may recognize two widely different functions of blood:

(*i.*) The part it plays in supplying a fluid medium occupying the cardio-vascular system and, as such, intimately bound up with the problems of blood pressure. An adequate quantity of circulating fluid is an essential for the maintenance of an efficient blood pressure. This is the purely physical function of blood.

(*ii.*) The vital function of blood, comprising as it does the mobile defences of the body in the way of leucocytes, antitoxins, agglutinins, opsonins, etc., developed as a response to attack by nocuous substances or influences. Chief of all the vital functions is the oxygen-carrying function, through the agency of the hæmoglobin of the red blood corpuscles.

The physical functions of the blood as fluid can be equally well carried out by any fluid of such an osmotic pressure and viscosity that it is retained in the cardio-vascular system, but the vital function of carrying oxygen to the tissues can be performed only by living red corpuscles. If these are lost to the body, their function can be replaced effectively only by supplying more living red corpuscles and this we do in blood transfusion.

With her customary lavishness, Nature has provided a considerably larger amount of hæmoglobin than is necessary for the due oxygenation of the tissues. As a result of his experimental work on bleeding animals and replacing the blood withdrawn by gum saline solution, Bayliss[2] came to the conclusion that if three-quarters of the hæmoglobin were lost from the circulation, the remaining quarter would be sufficient to carry out the oxygenation of the tissues, provided the blood volume were made up. While these figures may be taken as true for laboratory animals under artificial experimental conditions, with a minimum of associated shock, it is too low a standard in actual practice in which loss of blood is always associated with more or less shock from injury or operation. Other factors, such as exposure, cold, anæsthesia, are additional complications.

On clinical grounds, therefore, when the loss of hæmoglobin exceeds 50% to 60% of the total, *i.e.*, when more than half the total blood has been lost, the remaining hæmoglobin is inadequate to oxygenate the tissues efficiently and anoxæmia results. If life is to be carried on, more living hæmoglobin must be supplied, by transfusing blood from another individual.

In an average healthy adult of average weight, the total blood volume (which is difficult of accurate estimation) may be taken as between 4,500 and 5,000 c.cm., *i.e.*, eight to nine pints.

We are now in a position to classify the indications for blood transfusion somewhat as follows:

I. To replace blood lost from the circulation when the loss of blood is greater than half the total volume:

If the blood loss is less than this, gum-saline solution given intravenously or other solution of similar osmotic pressure and viscosity to blood is just as effective as blood in restoring the blood volume and the remaining hæmoglobin is sufficient to carry out oxygenation. In a healthy person the blood corpuscles lost after a moderately severe hæmorrhage are regenerated rapidly and the blood regains its normal composition in three to four weeks. For reasons which have been given in a previous paper, solutions containing crystalloids only, such as ordinary saline solution, even if hypertonic, are ineffective, as they pass out of the circulation almost as quickly as they are put in.

The conditions met with in actual practice, in which the blood loss is sufficiently large to require blood transfusion, are:

(*a*) Injuries or operations associated with severe shock-hæmorrhage (including secondary hæmorrhage with sepsis). For details of the excellent results obtained in such cases, reference may be made to the admirable paper by Holmes à Court,[3] of Sydney, giving in detail his results in severe war wounds.

(*b*) As a preliminary to operation and perhaps also after operation, in patients who have lost so much blood that a condition of grave anæmia exists. An operation which would otherwise be necessarily fatal, may thereby be successfully performed, *e.g.*, severe menorrhagia from pelvic tumours, hæmorrhage from gastric ulcers, etc..

(*c*) In the hæmorrhages of obstetric practice, *e.g., placenta prævia, post partum* hæmorrhages.

(*d*) Ruptured tubal pregnancy.

(*e*) Large hæmorrhages of certain diseases, *e.g.*, typhoid fever, blood diseases with large hæmatemesis.

Careful judgement is required in cases of internal hæmorrhage when there is reason to believe that hæmorrhage is still proceeding or is only temporarily and insecurely checked by temporary occlusion of the vessel concerned and by the lowered blood pressure. By injudiciously raising the blood pressure in such cases hæmorrhage may be restarted. If operation is contemplated, the transfusion can be given with most advantage after the bleeding has been arrested, *i.e.*, during the progress of the operation or after its completion. The clinical guides to the condition of the patient are, in order of their importance, the blood pressure, the pulse rate and the hæmoglobin content of the blood. A blood pressure lower than 80 mm. or a pulse-rate of more than 110 to 120, or hæmoglobin percentage less than 50, may be taken as reliable clinical guides. Most important of all is the hour to hour change in these.

As an example, I may quote the case of a patient in the wards of the Melbourne Hospital three months ago, suffering from severe abdominal hæmorrhage, as the result of a blow in the left epigastric region from a waggon pole. At operation the abdomen was found to be full of blood, the spleen split in halves and the stomach ruptured. After removal of the spleen and suturing of the stomach, his condition was grave. One litre and a quarter of saline solution were given subcutaneously during the operation and three-quarters of a litre of gum-saline solution intravenously at its conclusion. His pulse-rate was 130 and his blood pressure 60 mm.. Later in the night volunteers from his relatives offered themselves as donors; but, in the meantime, hourly record of his pulse and blood pressure showed continued improvement. The prospective donors were kept available for twenty-four hours; after this period they were told they would not be needed. The patient made an uneventful recovery.

Another illustrative case was one of *placenta prævia*, in which severe *ante partum* hæmorrhage occurred. Further large loss of blood occurred *post partum* and was complicated by severe streptococcal infection; the patient was rapidly going down hill. An estimation of the hæmoglobin by Sahli's method was inconclusive, as the medical man who performed the examination, found the hæmoglobin so low that it was with difficulty judged to be in the neighbourhood of 20%. To ordinary clinical appearances the patient was, literally, as white as a sheet She was transfused with 550 c.cm. of citrated blood from her father, over 70 years of age (her husband and brother both being incompatible) and after a stormy convalescence she made a good recovery.

Another recent case was that of a young woman with menorrhagia of obscure origin, but of so severe and prolonged a nature that when I first saw her her condition was so grave that a hopeless prognosis had been given. She was given 550 c.cm. of citrated blood. The immediate benefit was marked and was well maintained when I saw her on the following day. I have since been informed that she eventually recovered and is now recuperating in the country.

Such cases as these are the dramatic results of blood transfusion and no other form of treatment will save such patients. In them the blood loss is more or less uncomplicated and direct replacement of the lost blood from another person is a life-saving measure.

II. In blood diseases and anæmias of obscure origin:

The condition of affairs is, however, quite different in this group of cases. By transfusing blood we do not in any way get at the primary cause and, as previously stated, the procedure can, at the best, be of only transient benefit. Such conditions are: (*i.*) pernicious anæmia, aplastic anæmia; (*ii.*) secondary anæmias due to some toxic cause, malignant disease, tuberculosis, chronic infections, malaria; (*iii.*) splenic anæmia; (*iv.*) leuchæmias.

Except as an immediate life-saving measure in cases of severe or prolonged hæmorrhage, usually in the form of hæmatemesis in cases of splenic anæmia, we cannot expect much improvement after transfusion. The cause is quite obscure and the site of the disease is the blood-forming factories of the body, chiefly the red bone marrow. After transfusion the patient's condition may be temporarily improved by reason of the increased oxygen capacity of the blood, owing to the new red corpuscles introduced. These also improve the nutrition of the red bone marrow and further production of corpuscles by the patient may result. On the other hand, there are grounds for believing that the suddenly increased destruction of red corpuscles, thrown into the furnace as it were, may in itself be a cause of untoward symptoms after transfusion. It is therefore of importance to know what is the average life of a red corpuscle and so the length of time after which benefit from a transfusion can no longer be expected. It is possible to identify the transfused corpuscles and estimate their proportion of the whole by using a technique in which these corpuscles are agglutinated by the addition of the corresponding agglutinating serum to a specimen of the blood in an ordinary blood counting chamber. The percentage of agglutinated corpuscles is counted against the unagglutinated. Winifred Ashby[4] has made observations on this by first transfusing, say, a Group II. patient with Group IV. corpuscles. By adding Group IV. serum to a drop of such blood in a blood counting chamber, all the corpuscles are agglutinated except the Group IV..

By successive daily observations the gradual diminution of the number of Group IV. corpuscles can be observed. By this means it is found that thirty days is the average life of red corpuscles; this confirms the view previously expressed as a result of the earlier work by William Hunter and others. In blood diseases with rapid corpuscular destruction this period is probably much less. One is liable to over-estimate the actual increase in hæmoglobin as a result of transfusion in these

cases, unless this is actually worked out. For example:

A patient with 5,000 c.cm. of blood containing 50% hæmoglobin .. .. =	250,000
is given 1,000 c.cm. of blood containing 100% hæmoglobin .. .. =	100,000
Totalling 6,000 c.cm. of blood containing 58% hæmoglobin .. .. =	350,000

In the ordinary quantities used, 0.3 to 0.6 litre, the actual percentage increase of hæmoglobin or of corpuscle count is in the region of 5%, which is within the limits of experimental error in ordinary clinical methods of estimation.

The case of a middle-aged man, under treatment off and on for some six months previously, with symptoms of pernicious anæmia of more than two years' standing, may be briefly cited. He had the ups and downs so characteristic of the disease and at the time of his first transfusion with 230 c.cm. of citrated blood was at the worst of one of his "downs" (hæmoglobin 40%, red blood corpuscles 1,500,000). He no longer responded to any form of treatment; he had no appetite or, rather, he had an actual physical distaste for food; there was vomiting and diarrhœa and much mental depression. He felt much better as an immediate result of the transfusions, possibly aided by psychical influences, but his vomiting and diarrhœa were checked and he was again induced to take his food. A second transfusion of 426 c.cm. was carried out nine days later, with further improvement, although careful examination of blood films and hæmoglobin estimations failed to show any appreciable alteration. He then responded to further medical treatment, chiefly by intravenous injection of novarsenobenzol; his appetite improved and the diarrhœa ceased.[1]

If cases such as these are critically examined, the most we are justified in claiming is that, as a result of transfusion, the patient may be temporarily placed on a higher plane or tided over a crisis by reason of the increased oxygenation of his tissues and all that this implies in tissue metabolism, so that a readier and more effective response to medical treatment is again possible. In a series of 23 cases of blood transfusion for pernicious anæmia recorded by Graham,[5] of Edinburgh, he reaches similar conclusions, that, although transfusion may cause remission of symptoms, it cannot cure a case of pernicious anæmia or alter the course of the disease. The results are uncertain in any given case and not sufficiently consistent or permanent to justify its being strongly urged in cases of pernicious anæmia which are stationary or progressive or the patient is critically ill, in spite of the usual methods of treatment. Bloomfield's analysis of the cases treated at the Johns Hopkins Hospital[5] led him to similar conclusions. Moynihan,[6] in a recent paper, quotes the work of Percy, of the Mayo Clinic, who stated that there were three factors to be considered in the treatment of cases of pernicious anæmia:

(*i.*) To attempt to stimulate the production of new blood by massive step-ladder blood transfusions.

(*ii.*) To attempt to overcome the absorption of hæmolytic bacteria or toxins, by dealing with foci of infection.

(*iii.*) To attempt to protect the new and older red cells from destruction by removal of the spleen.

Moynihan gives a very guarded and qualified approval for splenectomy in certain cases of pernicious anæmia. For the actual indications and the extent of resulting benefit which can be legitimately expected, his original paper should be consulted.

III. In hæmophilia and certain abnormal conditions of the blood, such as purpura, the abnormal conditions of the blood in cases of severe jaundice, etc..

In these it is not that there is any deficiency in the corpuscular elements of the blood, but some defect or abnormal quality in its chemical make-up. The exact nature of the defect is not known, but is clinically manifested by a deficient clotting capacity and a tendency to spontaneous hæmorrhages, exceedingly difficult to check. In this group of cases, blood transfusion is extremely valuable. Unless hæmorrhage has continued for a long time before the patient is seen, it is not a matter of increasing the quantity of the blood, but simply of supplying the lacking qualities. Small amounts are, therefore, all that is necessary and, in fact, the injection of serum is usually equally efficacious. Human serum is preferable, given intravenously in injections of 20 c.cm. to 40 c.cm., but animal serum is frequently effective and is usually employed subcutaneously.

Injection of serum in known cases is also indicated as a prophylactic measure before operation.

In a hæmophilic patient recently in the Melbourne Hospital, under the care of another surgeon, the persistent bleeding from an abdominal wound of an operation for peritonitis was checked by the administration of 150 c.cm. of citrated blood intravenously.

Another example may be quoted in which a patient with severe jaundice and toxæmia from gallstones in the common bile duct suffered from persistent hæmorrhage after the operation. In this case, also, blood transfusion was effective.

Testing of Donors.

The simplest method is that in which the blood of a prospective donor and also that of the recipient are tested against known sera of Group II. or Group III.. The technique is as follows:

A drop of Group II. serum is placed towards one end of an ordinary glass slide and a drop of Group III. at the other end. A drop of the blood to be tested is taken on the end of a wooden safety match and mixed with the drop of serum, a separate match and a separate drop of serum being used for each serum. The mixed blood and serum are then gently tilted from side to side and up and down to insure good mixing. Within two minutes the reaction is evident and any agglutination present can be seen with the naked eye. If agglutination takes place in both drops, the blood belongs to Group I.. If agglutination takes place in neither,

[1] Since writing this, I have been informed that his improvement is being maintained.

it belongs to Group IV.. If agglutination takes place with Group II. serum and none with Group III. it belongs to Group III.. If agglutination takes place with Group III. serum and none with Group II. it belongs to Group II.. Persons whose blood is classified under Group IV., are known as "universal donors" and are generally used, although, of course, the blood of a patient of any group may be transfused from a donor of his own group, *e.g.*, a person whose blood belongs to Group II. may be transfused with blood of either Group IV. or Group II..

The only difficulty of this method lies in obtaining the known Group II. or Group III. sera. Fortunately, there is now available a sufficient number of people of known grouping from whom stocks of sera can be replenished from time to time. The serum is most conveniently put up in small ampoules like pituitrin and in this way will remain active for several months. They should be kept in a cool place. My original sera, sent out from the Lister Institute, remained active for several months and the sera I am now using have been put up for me by Mr. Harold Dew at the Walter and Eliza Hall Institute.

In the country, where stock sera are not available, it is always readily possible to do a direct test between the proposed donor's corpuscles and recipient's serum. A simple technique is as follows:

Draw off a few cubic centimetres of the patient's blood and allow it to clot in a tube. Take a large drop of quite clear serum, add the merest trace of sodium citrate and mix in a small drop of the donor's blood. Agglutination may be observed within five minutes, either macroscopically or microscopically. The only drawback to this method is the time taken up in waiting for clotting of the patient's blood, so as to get the serum; this may be expedited by centrifuging.

Another method is as follows: Collect five drops of blood of the donor in 1 c.cm. to 2 c.cm. of 3% sodium citrate. To this add stock serum (Groups II. and III.) or the serum of the recipient.

It will be noted that in the above tests we test donor's corpuscles against recipient's serum. This is the important factor to determine. The possible cross effect of donor's serum on recipient's corpuscles can be neglected, as the dilution of the donor's serum by the relatively much larger quantity of recipient's blood is such that any possible agglutination or hæmolysis from this source is so slight as to be negligible. In large transfusions it may be a possible explanation of the slight reactions which sometimes occur but which, in my experience, have never caused anxiety.

In desperate cases, where there is no possibility of testing the donor, the gamble of using an untested one might be legitimately taken, provided the transfusion were immediately suspended on the slightest signs of incompatibility. These will be manifest before more than 40 c.cm. or 50 c.cm. of blood have been given.

One further point may be touched on. The blood grouping of any single individual cannot be predicted from a knowledge of the group of his parents. Children of the same parents may, and usually do, differ in blood grouping from each other. Not even twins belong of necessity to the same blood group. Until recently it was held that the blood grouping became fixed at about the third year, thereafter to remain throughout life unaffected by illness or other outside influences. Bond,[7] however, doubts the accuracy of this and his interesting paper on the subject should be consulted by those interested.

Some recent work by Chavasse[8] has, however, shown that the blood group is determinable at birth and that the blood of the infant frequently differs from that of the mother. For this reason, infants should not be transfused with the mother's blood for *melæna neonatorum*, unless the blood of the mother has been tested and found compatible. As in hæmophilia, however, serum may be all that is needed, except in severe cases, where blood should be given.

References.

(1) The Medical Journal of Australia, 1920, I., p. 331, *et sequentia.*
(2) Bayliss: "Intravenous Injections in Wound Shock," London, 1918.
(3) The Medical Journal of Australia, 1920, II., p. 49, *et sequentia.*
(4) *Journal of Experimental Medicine*, March 1, 1919, p. 267, *et sequentia.*
(5) *British Medical Journal*, 1918, II., p. 63.
(6) *British Journal of Surgery*, January, 1921.
(7) *British Medical Journal*, 1920, p. 925, *et sequentia.*
(8) *British Medical Journal* 1921, p. 641.

OBSERVATIONS ON BLOOD TRANSFUSION.[1]

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In this paper it is my intention to bring before you, under various headings, those matters connected with blood transfusion which have interested me most in the cases under my own observation.

(1) Risk to the Donor.

A healthy donor should not be in danger from loss of blood alone.

I have repeatedly bled donors till the onset of faintness without ever having seen any harm result. The largest amount that I have taken at one time from a man is 1.4 litres. The systolic blood pressure fell from 126 mm. *Hg.* to 120 mm. *Hg.* and his pulse-rate increased from 60 to 80 per minute. When he was seen a few hours later, his pulse-rate and systolic blood pressure had returned to normal.

No unpleasant effects have come under my notice. On the contrary, one donor from whom I recently took blood on three occasions, increased in weight and after each bleeding got considerable relief from asthmatic attacks to which he was subject.

The gravest risk which the donor runs is that sepsis may be conveyed from a septic patient or from some other source by a piece of apparatus or by the surgeon's fingers to an opened vein of the donor. This risk should be exceedingly small in the citrate method; with care it should be avoidable

[1] Read at a meeting of the Victorian Branch of the British Medical Association on July 6, 1921.

in the paraffin ampoule method; but it must be regarded as a most serious defect in any method demanding close proximity of the arms of donor and patient.

(2) Comparison of Methods.

A.—Direct Arm-to-Arm Method.

The direct arm-to-arm method gives to the patient unaltered blood; but it is a little troublesome in technique, the amount of blood transfused is not known and in infective cases it carries a decided risk that a healthy donor may be infected by contact with the septic blood of the recipient.

After using the method with satisfaction in two cases, an instance of fatal infection of a donor in another hospital came to my knowledge and accordingly I never used this method again.

B.—Paraffined Ampoule Method.

The paraffined ampoule method has the following advantages:

(*i.*) The blood is not mixed with any foreign substance and if no delay occurs in the filling and emptying of the ampoule, the blood so transfused may be regarded as practically unaltered from the normal venous blood.

(*ii.*) Unpleasant reactions, such as shivering and urticaria, were uncommon in my experience of this method (about 4%).

(*iii.*) With this method one also has the satisfaction of knowing how much blood is being used.

The disadvantages are as follows:

(*i.*) The method requires the co-operation of at least one trained assistant.

(*ii.*) Considerable time and care must be given to the preparation of the ampoule beforehand, otherwise clotting of the blood will occur in the ampoule.

(*iii.*) If more than one ampoule has to be used, infection may be carried by the operator's fingers from the patient to the open vein of the donor.

A careful antiseptic technique should overcome this defect and while no case of infection occurred in my own experience, I know that such infection did happen occasionally in France.

(*iv.*) The glass nozzle of the ampoule is inconveniently large for insertion into the small veins of children.

The same criticism applies to the syringe methods which I have seen used, but which I have never adopted.

C.—The Citrated Blood Method.

The citrated blood method has the following advantages:

(*i.*) An assistant is not necessary, though one is desirable.

(*ii.*) The technique is very simple; there is no need for hurry and the donor can be safely dressed and put out of infection's way before the recipient is touched. Accordingly, this method carries the minimum of risk to the donor.

It has the following disadvantages:

(*i.*) The blood is, however, mixed with a foreign substance and cannot be regarded as normal. In my experience unpleasant reactions in the recipient have been frequent (about 30%).

These reactions, which were not so common in patients suffering from hæmorrhage only as in those suffering from anæmia from other or additional causes, sometimes took the form of rigors, followed by a high temperature and rapid pulse for a few hours. Other patients complained of a most distressing feeling all over the body and limbs, which they described as a "drawing up" or "tightness" or "constriction." This unpleasant sensation seemed to be due to increased muscle tonus and might pass off or might be followed by a rigor. It occurred independently of the rate of transfusion.

Such symptoms excite alarm in the patient, who needs to be constantly reassured; but I have never seen any real harm follow these phenomena, nor have I ever cut short a transfusion on account of their onset.

In the few patients who were still anæsthetized when I transfused them, these reactions were not evident, though a subsequent high temperature with rapid pulse sometimes was observed for a brief period.

(3) Technique.

In technique there is one point which I think is important in all operations involving opening a vein; it is to select for the first puncture a vein of suitable calibre as near the periphery as possible. At each subsequent puncture a slightly more proximal site should be used.

If at the first puncture a vein at the bend of the elbow is selected, the veins of the forearm below may be rendered unsuitable for subsequent use and the sites for succeeding punctures are thereby limited.

When an injection has been made into a vein, a thrombus may form at the site of the wound. If, shortly afterwards, an injection is made into the vein at a more peripheral site, the thrombus can become detached to form an embolus. The danger may seem slight, but is nevertheless real and can be avoided.

The routine use of a large vein at the bend of the elbow for intravenous injections, without a preliminary search for a suitable vein in the forearm or on the back of the hand, is undesirable.

(4) Selection of Donors.

In hospital or military practice, where it is desirable to have ready for immediate use donors whose blood will be suitable for patients of any blood group, the donors should all belong definitely to Group IV..

They are tested at leisure, so as to be available in a hurry.

However, in many civil cases in which a blood transfusion may be indicated, there is no urgency and it is not necessary to test exclusively for a Group IV. donor.

It is just as satisfactory, and it may be more convenient, to test a proposed donor's blood directly against the patient's blood.

Once compatability is demonstrated by absence of agglutination *in vitro*, the particular group to which the donor may belong is immaterial.

In selecting a donor, a person who has had syph-

ilis or malaria or who has recently suffered from any fever, should be rejected as unsuitable.

An unemotional, muscular male adult with large veins is to be preferred to a female or an adolescent or a subject with much subcutaneous fat or with slender veins.

Dissimilarity of race is no bar. Once I have used a South Sea islander and once a half Mongolian as donors. In each instance the blood was given to a Caucasian.

The recipient of the islander's blood got a slight urticaria next day, but otherwise did perfectly well. The Mongol transfusion differed in no way from other transfusions where Caucasian blood was used.

Once a menstruating woman was used as a donor. Her child was benefited and she herself suffered no ill-effects.

(5) Untested Donors.

In twenty-one of my transfusions for hæmorrhage, for one reason or another, untested donors had to be used. Fourteen of the patients transfused with untested blood died and seven survived. Contrasted with these results, of fifty-four somewhat similarly wounded patients transfused with Group IV. blood, seventeen died and thirty-seven survived. The numbers are too small for comparison. Moreover, the first group contained men probably more severely wounded than those of the second and treated under decidedly more disadvantageous conditions of climate and transport.

The cases are, therefore, not strictly comparable, but, if they were, the results might be read thus that, whereas roughly 70% of patients were resuscitated by the use of tested blood, only 30% were restored to life when given blood from untested donors and that therefore 40% died because they were transfused with unsuitable blood.

In my opinion, however, the results should be looked at from a different point of view. These twenty-one men were all in such a desperate condition that a blood transfusion was considered to give them their only chance of survival; and, as a result of using whatever blood was available, 30% who would otherwise have perished, were brought back to life and recovered. In each group the paraffin ampoule method was used.

When untested blood was given the method used was to transfuse slowly one hundred cubic centimetres or more of blood and then to wait about four minutes for any untoward symptoms. If none appeared, the transfusion proceeded without further delay.

In all these fatal cases, except one, the patients survived for over forty-eight hours and died from what was regarded as acute sepsis.

Post mortem examination was made in every case as soon as possible after death and no instance of intravascular clotting was noted, but in four cases deep yellow pigmentation of all the tissues was observed. Possibly this may have been due to hæmolysis from incompatible blood; but a similar pigmentation from hæmolysis by septic organisms was seen in patients who had not been transfused.

Hence it appears to me that, if hæmorrhage has been so severe as to make death imminent, it is justifiable to use the untested blood of the first healthy donor available.

There is a good chance that your unselected donor may have compatible blood; there may be a "next to nothing" chance of your exsanguinated patient surviving if you have to await the services of a tested donor.

(6) Transfusion for Anæma Due to Hæmorrhage.

Everyone is agreed that compatible blood is by far and away the best material to replace blood which has been lost in large amounts.

If a patient is suffering from the effects of hæmorrhage and shock also, his chances of recovery can be improved by replacing his lost blood by transfusion. Transfusion for shock alone, without hæmorrhage, is not effective in insuring recovery.

Transfusion before operation, however, is a good preventive measure against post-operative shock, especially if there has been, or is likely to be, considerable blood loss.

(7) Transfuson for Anæmia Not Due to Hæmorrhage.

In anæmia due to hæmorrhage without accompanying sepsis, it can definitely be said that transfusion will restore the patient to normal.

The same prophecy cannot be made of anæmia associated with sepsis or malignant disease or of the anæmia of uncertain origin, such as pernicious anæmia.

A patient with anæmia may be only temporarily improved or he may be started on the way to convalescence and recovery.

Occasionally the very opposite happens and an anæmic patient may be made decidedly worse by a transfusion and may even die in consequence of it.

In pernicious anæmia, small, repeated transfusions, with or without splenectomy, have been tried and have, on the whole, been successful in giving relief and in prolonging life; but it is doubtful whether they can yet be considered to offer a prospect of cure.

Sometimes in anæmia of pernicious type a transfusion has been followed by the appearance in the blood of large nucleated cells in considerable numbers and by an intensification of the rate of blood destruction, going on very rapidly to a fatal issue.

(8) Transfusion in Hæmophilia.

I can speak of the successful use of citrated blood in two cases of hæmophilia.

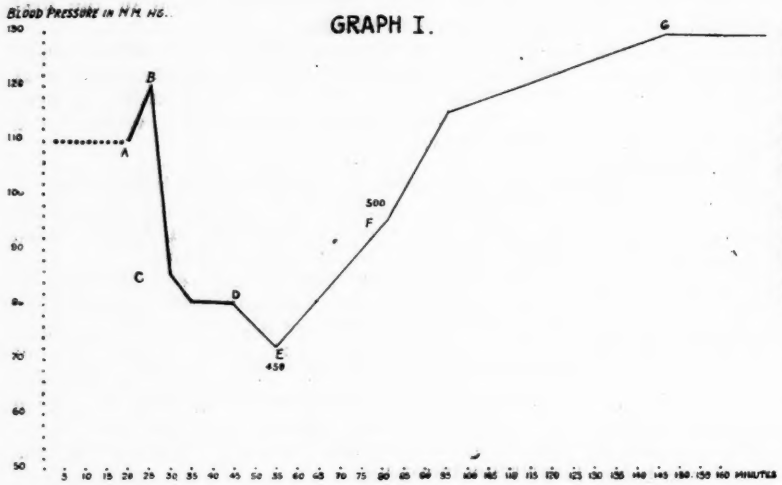
The defective clotting in hæmophilia is not due to lack of calcium and no harm need be anticipated from the small amount of citrate thrown into the circulation with the transfused blood.

(9) Transfusion for Sepsis.

A patient who has lost much blood, resists infection weakly and early transfusion after hæmorrhage is a valuable prophylaxis against sepsis.

In acute sepsis I have not seen any definite advantage in transfusion *per se* over administration of fluid by other means.

In chronic sepsis associated with a decided secondary anæmia, such as is seen in long-continued suppuration about a compound fracture or in



Graph I..

This graph illustrates the effect on the systolic blood pressure of the transfusion of 950 c.cm. of blood at the end of an amputation of the thigh in the upper third in an anæmic patient who was not suffering from sepsis.

In the abscissa is given the systolic blood pressure in millimetres of mercury, each division representing two millimetres. The ordinate gives the time in minutes, each division corresponding to 2.5 minutes.

The patient had lost a considerable amount of blood from a mangled thigh, but appeared to be a good surgical "risk." At the end of the amputation he appeared to be profoundly shocked, but revived rapidly after the transfusion of 950 c.cm. of blood and convalesced without incident.

A: Operation commenced.

B: Division of skin, muscles and nerves.

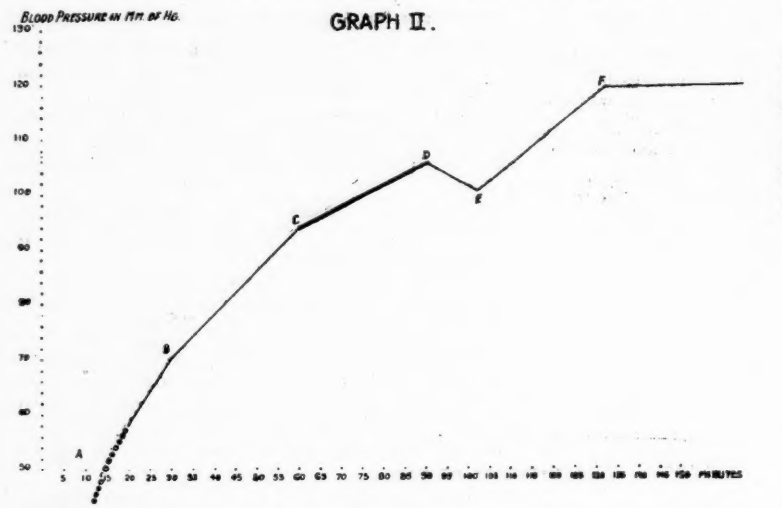
C: Bone sawn through.

D: End of operation.

E: Patient looking very shocked. Commencement of transfusion.

F: Transfusion of another 500 c.cm. of blood.

G: Blood pressure reached normal and remained there.



Graph II..

As in Graph I., in the abscissa is given the systolic blood pressure in millimetres of mercury, each division representing two millimetres. The ordinate gives the time in minutes, each division corresponding to 2.5 minutes.

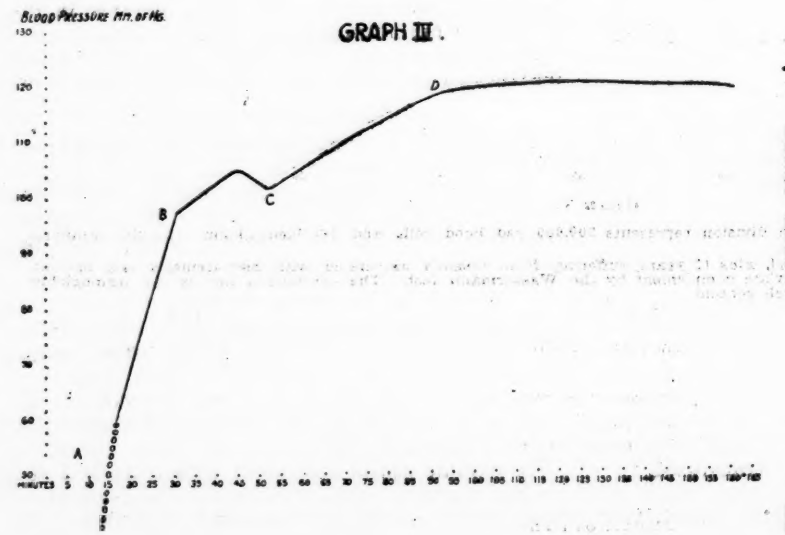
This graph gives a record of blood pressure, taken at five-minute intervals, in a patient with a mutilated thigh and anaerobic sepsis of the sartorius and other muscles, illustrating the slow, but continuous, rise of blood pressure after transfusion of 950 c.cm. of blood.

A: Patient exsanguinate and unconscious, pulse not perceptible, blood pressure unknown; given 950 c.cm. of blood.

B: End of transfusion; pulse perceptible, patient conscious.

B to C: Waiting for blood pressure to rise to a satisfactory height before commencing operation. The slowness of the rise was probably due to the accompanying sepsis. (Compare with rapid ascent of blood pressure in Graph III., where sepsis was absent.)

C to D: Amputation of thigh in upper third and excision of gangrenous muscle. Note that the blood pressure continued to rise in spite of the shocking nature of the operation, with a small post-operative fall to E and then a rise fairly rapidly to normal at F. Uneventful convalescence.



Graph III..

As in Graphs I. and II., in the abscissa is given the systolic blood pressure in millimetres of mercury, each division representing two millimetres. The ordinate gives the time in minutes, each division corresponding to 2.5 minutes.

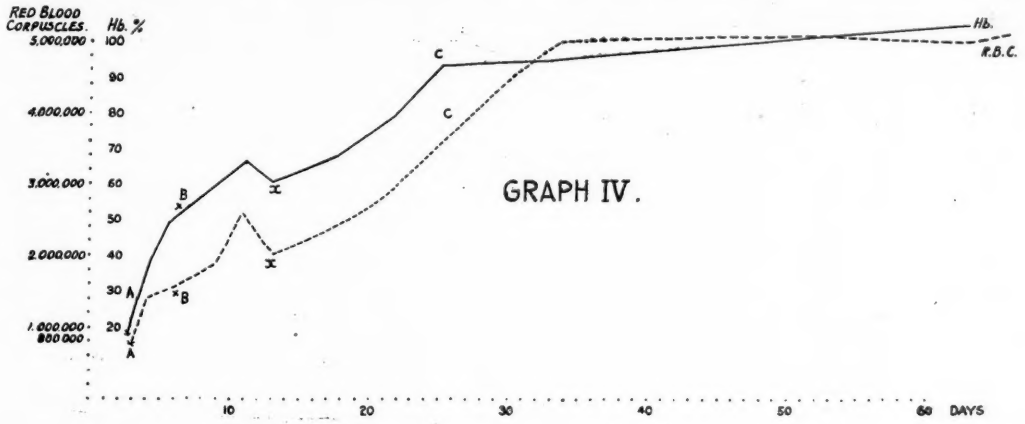
This graph gives a record of systolic blood pressure, taken at five-minute intervals, in a patient with a mutilated leg who had lost much blood but who was not septic.

A: Patient faint and exsanguinate, pulse not perceptible, blood pressure not ascertainable; given 950 c.cm. of blood.

A to B: Rapid return to consciousness, with sharp rise of blood pressure.

B: Operation commenced, amputation of thigh; blood pressure continued to rise during the operation, with a small fall to C at the close of the operation and thereafter a continuous rise to normal. Normal convalescence.

Compared with Graph II., the rapidity of recovery unchecked by sepsis is noteworthy.



GRAPH IV..

In the abscissa each division represents 200,000 red blood cells and 4% hæmoglobin. In the ordinate each division represents one day.

This graph gives a record of red blood corpuscles (interrupted line) and hæmoglobin (continuous line) in a girl, *ætas* 8 years, suffering from anæmia of uncertain origin.

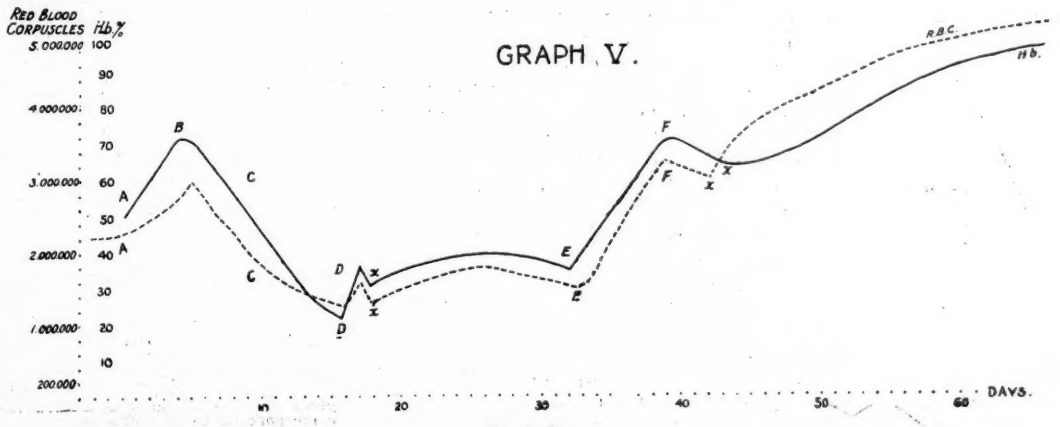
A: Before transfusion the red blood corpuscles numbered 800,00 and the hæmoglobin 20%. The child was waxen in appearance and looking as if about to die at any moment; hæmorrhages were subcutaneous and submucous. The child was given 450 c.cm. of blood from an unrelated donor.

B: Astonishing improvement in appearance of child. She was given another 450 c.cm. of blood from the same donor. Improvement was accentuated and sustained, so that at C the child appeared to be restored to normal, though the red blood cells count and hæmoglobin percentage continued to rise.

Several months later the child again became anæmic and continued observation showed the transition to an acute leuchæmia, with a fatal termination.

At *x* (see also Graphs V. and VI.) there is a slight drop in the red blood cells and hæmoglobin. This short negative phase seems to be constantly present, though the time of onset after transfusion varies.

Note also in this Graph and in Graphs V. and VI., that there is a similarity, but not a parallelism, in the red cell and hæmoglobin curves.



GRAPH V..

As in Graph IV., in the abscissa each division represents 200,000 red bood cells and 4% hæmoglobin. In the ordinate, each division represents one day.

This graph represents the chart of a girl, *ætas* 12 years, suffering from anæmia associated with hæmatemesis and melæna and a large spleen. The serum did not deviate complement by the Wassermann test. The continuous line is the hæmoglobin content and the dotted line the red blood cell content.

A: Hæmogobin, 50%; red blood cells, 2,300,000. Transfusion of 450 c.cm. of blood from an unrelated donor. Slight cramps and shivers.

B: Rise in the red blood cell and hæmoglobin contents, but actually the child was very ill, jaundiced and showing a herpetic eruption on the face.

C: Melæna.

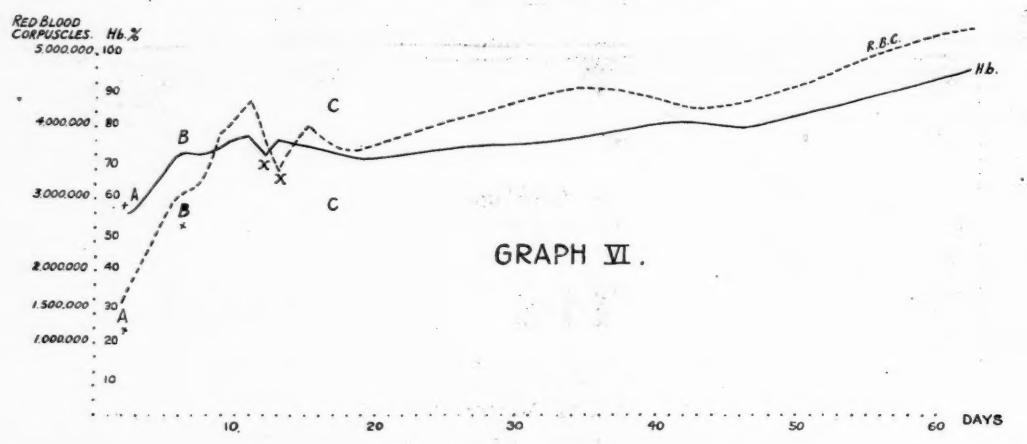
D: Red blood cells and hæmoglobin much lower than when first seen, i.e., the child was not improved, but was worse off after the transfusion. Some abnormal nucleated forms were seen in the circulating blood. She was given another 450 c.cm. of blood from the same donor. There were no untoward symptoms during or after transfusion.

D to E: Gradual improvement (negative phase at *x*), but not better than when first seen at A.

E: Transfusion of 540 c.cm. of blood from the same donor and splenectomy.

E to F: Rapid improvement and subsequent attainment of the normal (negative phase at *x*). Normal blood picture maintained ever since.

Transfusion alone, therefore, was of doubtful value on the second occasion of its use and apparently hastened convalescence after splenectomy, but appears to have been definitely harmful on its first use.



GRAPH VI.

To show the gradually beneficial effect on the red blood cell and hæmoglobin contents of the blood of transfusion in anæmia caused by chronic sepsis (compound fractures of both legs in a young adult male).

A: Red blood cells, 1,500,000; hæmoglobin, 55%; patient miserable and listless, wounds weakly suppurating. He was given 900 c.cm. of blood; there was a slight rigor and subsequent short, feverish reaction.

B: The patient was livelier and was given a second transfusion of 900 c.cm. of blood from another donor; again a slight rigor and fever reaction.

C: The wounds were no longer indolent, but were actively healing and the patient had become cheerful and vastly changed for the better in appearance and demeanour. This improvement was sustained and henceforth he progressed rapidly in his convalescence.

chronic dysentery, repeated transfusions are worth doing, though the dramatic improvement which follows transfusion for hæmorrhage must not be expected. I have seen many such patients commence gradually but surely to convalesce after transfusion. They regained their appetite, became less querulous and more contented and their wounds lost their indolence and healed.

It is worth while following up any improvement by further transfusions till convalescence is assured. It happens sometimes that the removal of a diseased structure is the only means of obtaining relief from sepsis, yet the patient may be too weak and anæmic to stand such an operation. A transfusion just prior to operation may render the patient quite fit to stand radical surgical measures designed to effect his recovery.

(10) Transfusion in Children.

In very young children or infants the small size of the veins presents a decided difficulty and it may be necessary to expose a vein in the upper arm or even in the neck.

It is stated that in an infant whose fontanelle is open, transfusion may be made into the superior longitudinal sinus, but the space available is small and it is not an easy matter to keep the needle point entirely within the sinus, specially if the infant cries or moves its head about.

A parent cannot with safety be assumed to be a compatible donor for his or her child. During the last year I have transfused children whose parents' bloods have both been found suitable by testing. In other children either mother or father has been unsuitable as donor and one patient recently at the Children's Hospital had parents whose blood was both unsuitable for transfusion to their child.

A few of the effects of transfusion may be graphically illustrated in the accompanying charts.

LIMPING.

By W. L. Potter, M.D. (Melb.),
Base Hospital, Repatriation Department, Melbourne.

OF the disturbances of normal gait, limping is that most commonly met with and is the result of an interference with the even alternation of the stride. This interference is mechanical in nature and usually is not confused with abnormal gaits the result of nervous disease. The halt produced may be more or less prolonged and the loss of harmonious movement pronounced to a corresponding degree. Like so many activities and phenomena met with in the study of medicine, the halt is very often found to be protective; indeed, it is always so if simple cases of marked shortening and of want of alignment and of stiffness be excluded, the protection being exerted to save the individual from pain or want of support during locomotion. In a well-marked case of limping the sound leg supports the body for almost the whole duration of progression, its stride forward being rapid while the injured leg upholds the weight of the body. The pause is prolonged as the sound leg supports in turn and the unsound leg swings forward slowly again to take the weight of the body momentarily. In this way the sound limb supports for a longer period than the affected limb and the asymmetry of gait is the result of this difference in the time taken to perform the respective strides. It is not the result of inequality in the length of stride, since the latter would result in one leg walking away from the other, which could not go on for many strides.

The elucidation of cases of limping calls for careful examination, especially in war injuries, with which this paper is mainly concerned, since the variety of injuries is so great and cases so rarely

resemble one another closely that each must be worked out independently, in order that a rational treatment may be devised. Just as during the war the task of the medical officer was to determine fitness or otherwise for service, so now, in the period of repatriation, it is to decide as to fitness for work, suitability for training in skilled occupations or eligibility for pension. The necessity for detailed examination need not be emphasized. It has happened that a limp has been found to be incompatible with the condition complained of and that a pensioner has halted on the wrong leg.

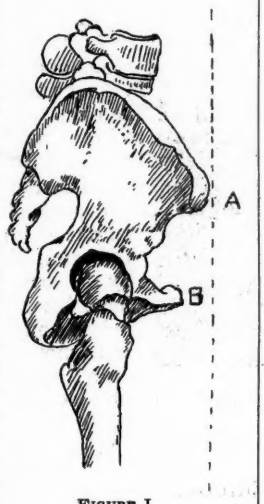


Figure I..

To explain all limps would involve the discussion of the action of almost every muscle and joint of the lower limb; the action of individual muscles might be guessed at, but muscles work in teams and to explain the co-ordinate action of all the muscles would not be easy. An effort may be made, however, to explain the more important features concerned in the commoner types of limps and to indicate the muscle or group of muscles mainly involved.

Walking is so complex a function, one in which gravitation and momentum play important parts and economize muscle action, but in which muscle action is predominant, that any disturbance of co-ordination or want of balance between opposing groups or any abnormality in the parts on which they act is at once reflected in the gait. The large joints of the lower limb are the centres of enormous strain during locomotion and they are so closely associated with one another that the impairment of any one limits the degree of usefulness of all the others. In the young and athletic muscle action is at a maximum and momentum plays an important part. Extreme movements of joints and extreme tension on ligaments occur but momentarily, so that the gait is elastic, graceful and delicately controlled. But as muscle function becomes less efficient and the balanced action of muscles less reliable or impossible, more use is made of gravitation and more reliance placed on the passive action of ligaments, so that in the aged and weak and paralytic, in order to economize the use or dispense with the assistance of weak or paralysed muscles, there is a tendency to secure control over joints by throwing a maximum and powerful strain on their ligaments and in order that equilibrium may be maintained, the line of gravitation must be altered, with consequent alterations in the position of other joints. The laboured, toneless gait, with little assistance from momentum and the characteristic attitude involving hip, knee and ankle are the result. The healthy tingle after exercise in the toned-up calf muscles of the young contrasts with the weary, aching of the joints in the debilitated or flat-footed. The exaggerated erectness of the drill-hall athlete, with pelvis tilted forwards (see Figure I.), throwing the whole onus on the muscular system and involving an unnatural strain that cannot be maintained comfortably, contrasts with the attitude of the aged, who make full use of gravitation in allowing the pelvis to fall back to its limits and so throw a maximum strain on the ilio-femoral ligaments (see Figure II.). But in the swing of the athlete is seen the harmonious movement that follows the minimum of effort when muscle function is at a high level, but is economized by the taking of appropriate advantage of momentum and of the force of gravitation (see Figure III.).

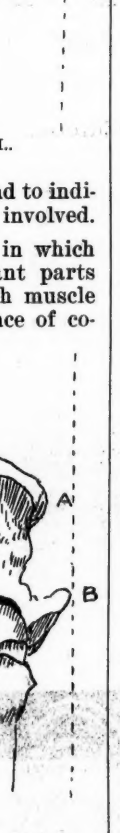


Figure II..

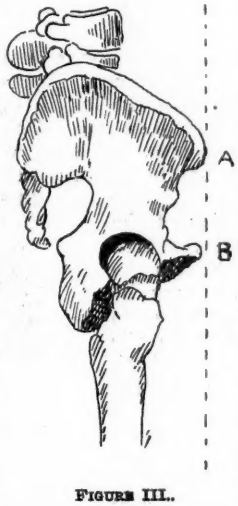


Figure III..

While shortening and faulty alignment and lessened joint mobility account for many halts, the causation they represent is purely mechanical. The most interesting of limps are concerned with want of stability of joints, the result of some abnormality in muscle function, and, while these also are mechanical, they are less purely so and less simple than the foregoing.

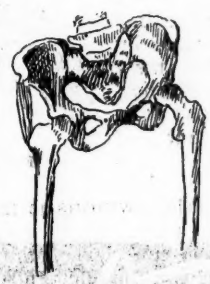


Figure IV..

Where shortening occurs without any complication, such as stiffness or faulty alignment or want of support, the simplest cases of limping are represented and they may be considered now. Unless the shortening is marked, the halt is not likely to be very manifest. Shortening of the stride will be present, of course, in greater or lesser degree, but that will not necessarily produce a halt, as the sound limb must accommodate itself to the affected member, in order that progression may be maintained. As can be seen in Figure IV., the halt occurs during the laboured effort required on the part of the *gluteus medius* and *minimus* of the

sound side to rotate the pelvis on the sagittal axis of the sound hip and to raise it from its tilted down position and to poise it on the head of the femur of the sound side. The potential energy of this position enables the stride forwards of the short limb to be easily and quickly executed and the glutei of the affected side, in turn, have an easier task in rotating the already tilted down pelvis than their fellows of the sound side.

It is often a difficult matter to decide how to deal with marked cases of limping of this nature. Theoretically, the only remedy, to reduce the length of the sound limb, would be resorted to rarely. With the boot built up many centimetres, ankle movement is much limited, if not quite thrown out, which practically involves fixation of the knee during weight-bearing and limitation of the movements of the hip, so that the man props along on a stiffened limb. On the other hand, the built-up boot may be thrown away and the patient educated to walk with a pelvis tilted down on the affected side (see Figure V.), so that both legs are square on the ground and the shoulders level, at the expense of a marked scoliosis. This brings before us the picture of the orthopædist measuring the limb with meticulous care and building up the boot one centimetre in a case of scoliosis and neglecting many centimetres of shortening and deliberately producing an extreme scoliosis in order to conceal a limp.

Walking with the pelvis tilted down on the side of the shortened limb involves the loss of certain mechanical advantages that take part in the normal function, with consequent increased strain on muscles and joints. The pelvis, being tilted down throughout locomotion, cannot be poised on the sound leg during the period of support of the latter; the line of gravity cannot be moved outwards by the action of the abductors on the freely movable hip-joint, but, instead, an abnormal strain must be thrown on the talo-calcanean joint, the movement of which is distinctly limited and it becomes the centre for abduction in place of the hip-joint. Apart from this, an enormous strain is thrown, not only on the abductors of the sound hip, but also on the trunk muscles of the same side, in order to maintain equilibrium, and, as no abduction at the hip occurs, relaxation of the ilio-femoral ligament is either diminished or lost and the pelvis is prevented from falling backwards on the transverse axis of the sound (supporting) hip and from carrying the swinging limb forwards without muscular effort. The movements therefore tend to be cramped and laboured and to be carried out at an abnormal expenditure of energy. On the other hand, there is a gain of stability, as both feet are on the ground and the patient no longer feels that the foot corresponding to the shortened limb is resting on an insecure platform.

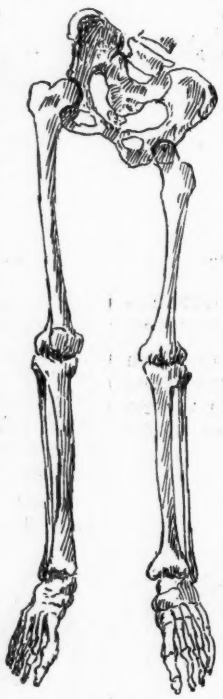


Figure V.

It must be recognized in this class of work that damage or destruction may be inflicted to tissues which nothing can restore. The best must be done with what remains and efforts to improve matters must be carefully considered. Interference with the limp should be avoided as far as possible. In cases of slight shortening there is no need to build up the boot; in moderate degrees of shortening the boot may be built up, but not to the full extent of the shortening, and in cases where the shortening is great the boot may be built up to an appropriate degree. The question whether the boot itself might be made to hinge on its pedestal, so as to preserve ankle movement, is under investigation.

Although a shortening of five centimetres in the lower limb involves the swinging of the top of the spinal column 20 cm. from the middle line and, although this must be followed by a corresponding scoliosis, men who have been taught to walk with a tilted pelvis and level shoulders have been seen with more than five centimetres of shortening and have got about with considerable comfort. It will therefore be recognized how necessary it is to investigate the case of each individual patient.

If there be a considerable amount of shortening, it is well not to try to eliminate the limp entirely, as that cannot be done without causing some disability elsewhere that may counteract any apparent advantage gained. Quite a large amount of shortening may be present, yet, if the patient walks with the pelvis tilted to a moderate degree not sufficient to impose a severe strain on joins or muscles, the mobility of the ankle may be preserved and locomotion effected comfortably with a limp that is negligible.

The treatment of these cases should not be carried out in a haphazard or routine manner, but an effort should be made to determine the possible result of treatment and to devise an appropriate scheme before any treatment is instituted. If it be decided to build up the boot considerably or to make use of a patten, it is obviously a waste of time and effort to restore normal mobility to a stiffened ankle by tenotomy and months of physio-therapy. On the other hand, should it be considered desirable to teach the man to walk with a tilted pelvis, the tolerance of the spine to the consequent distortion must be estimated.

When the shortening is complicated by ankylosis of the hip, but the necessity of obtaining fixation in abduction has been overlooked or fixation in such a position rendered impossible by the nature of the injury or the exigencies of service, the patient will not be able to walk with the pelvis tilted down on the affected side, because in a marked case the apparent adduction following such a position would carry the shortened limb across its fellow. In patients having the hip-joint ankylosed with adduction, it is necessary to tilt the pelvis up on the

affected side, in order that locomotion may be effected. An instance of apparent shortening being combined with real shortening is well seen in an old case of tuberculosis of the hip in which the limb was shortened by 7.5 cm. and the joint fixed in adduction and, in consequence, the pelvis had to be tilted up 5 cm. to 7.5 cm. in order to get the legs parallel in the standing position, while the foot of the affected side was 10.5 cm. to 15 cm. from the ground. If locomotion is to be improved in such cases of war injury, the indication for operative treatment is obvious and should an osteotomy be done, union must be brought about with a further degree of abduction than appears necessary at first sight, in order to allow the pelvis to come down on the affected side, to compensate to a greater or lesser degree for the actual shortening.

Reports of Cases.

TWO FATAL CASES OF ACUTE ASTHMA IN CHILDREN.

By J. de B. Griffith, M.D.,
Medical Officer of Health, Somerville, Victoria.

On May 29, 1921, I was called to attend a girl, three years old, suffering from respiratory distress. She was a fine, handsome child, but was evidently in great distress and appeared to suffer "air hunger." On close examination the characteristic sounds of asthmatic breathing were quite evident. I ordered her removal to the private hospital opposite my house, where a hot bath was given. This gave some relief, but loud and distressful breathing continued. The child could not lie down nor sleep. I then got some asthma powders (Himrod's), which have been of great benefit to adult patients. The fumes of this were inhaled but with only slight relief. I administered a mixture of ipecacuanha and ammonia, but without relief. I then gave 0.005 gramme of morphine under the skin and procured relief, but the child died the same evening, apparently suffocated.

Her elder brother, aged five years, also appeared very ill, but went about; his breathing was loud and embarrassed. He was put to bed and hot fomentations applied. I also gave him Himrod's asthma powders to inhale, but without apparent benefit. I administered some brandy and water and went through the various approved treatments of asthma. All the remedies were without avail and he died within two days. There was no heart disease nor lung consolidation. On these points I reassured myself.

These children came from the Mallee, I think, Hopetoun. At this place they had suffered from wheezing, but the climate is warm and dry, so much so that the mother of the children could not endure the summer heat. It was chiefly on her account that the transfer from the Mallee to the cool climate of Pearcedale was determined on. I may say the change took place in a very wet and cold period of the year and this has accentuated the original trouble. I ask any of your readers or yourself for a suggestion as to causation or remedy.

Reviews.

NEUROLOGY.

"The Form and Functions of the Central Nervous System," by Frederick Tilney and Henry Alsop Riley,[1] both of Columbia University, is a scholarly demonstration of the high position in neurology attained by the American school. For a number of years both writers have taught the anatomy of the nervous system and their book is primarily a treatise on anatomy; but it is much more than this, as each division of the nervous system is taken up, not only morphology and histology, but important points bearing on phylogeny, embryology, physiology and pathology are indicated and the whole made pertinent in its actual application to clinical medicine. In other words, an attempt is made to provide a clinical and physiological interpretation of the central nervous system adequate to the requirements of practical application; in this way the book differs from any other we have read.

To give an idea of their method, we may take the description of the cerebellum. This opens with a general view of its evolutional significance, showing that the cerebellum was originally endowed with and persistently retains control of the definitely fixed and fundamental reactions. Next its outward form, from *petromyzon* (Lamprey) to *homo*, is described and figured, in doing which the classical work of Bolk and Elliot Smith is judiciously drawn upon. There follows an account in detail of its development, its histology and its numerous connexions. Then the functional significance of the organ is dealt with and experimental research from the time of Flourens to the present day is passed in review. Finally, an exact and full picture is drawn of a patient offering the cerebellar syndrome. We thus get a presentation of the cerebellum from every point of view, comprehensive, yet concise, and for reference purposes having equal value for the physiologist, anatomist and clinician. These chapters on the cerebellum are so well done that we are loath to make any adverse comment. We must say, however, that we are surprised these evidently well-informed writers have made no mention, not even in the references for supplementary reading, to the experimental work of Horsley and Clarke. This, it may be remembered, cast doubt on the question of the excitability of the cerebellar cortex, while accentuating the excitory importance of the cerebellar nuclei; to us it seemed a hindrance to the acceptance of many conclusions by others concerning the localization of functional areas in the *cortex cerebelli*.

The subject matter of the spinal cord is also set forth in an able manner, dry details of structure being made interesting and given practical illustration in a way which can be understood by all. First, the course of the various tracts of fibres is described and figured and coincidently the function of each is explained. Then the clinical history of typical examples of the various syndromes is given, for example, that of the ventral grey matter illustrated by infantile paralysis, that of the dorsal white matter illustrated by *tabes dorsalis* and these syndromes are anatomically analysed and made clear. We must ask, however, why in the account of the syndrome of the dorsal root ganglion (*herpes zoster*) an affection of four ganglia is described, when the almost invariable rule is that one ganglion alone is affected.

The usefulness of the method as applied to the spinal cord becomes even more apparent when the medulla, pons and mesencephalon are reached, because they are parts whose anatomy is infinitely more intricate. Lastly, the chapters on the brain proper are full of instruction.

Of such a book a single-handed criticism is difficult, because one person can scarcely carry information on all points of such an extensive field. It appears, however, that if in the wealth of anatomical and physiological details submitted there are mistakes, they are not of importance. And the work is not a mere compendium; it embodies much original research and, wherever function is considered, there is originality of thought, without detriment to accepted views and without trespassing too far on debatable ground.

The book is beautifully illustrated, containing numerous original photographs and diagrams and is well written and well arranged. That it is up-to-date is proved by the inclusion of the recently-published work of Head on the functions of the cerebral cortex in relation to sensation. A glossary, preceding an excellent index, adds completeness to the volume. Here we would only suggest, having regard to the ever-increasing number of syndromes linked with the names of their describers, that it would assist our memories if these were grouped and the distinguishing anatomical lesion inserted.

[1] "The Form and Functions of the Central Nervous System: An Introduction to the Study of Nervous Diseases," by Frederick Tilney, M.D., Ph.D.; and Henry Alsop Riley, A.M., M.D.; 1921. New York: Paul B. Hoeber; Royal 8vo., pp. 1020, with 760 illustrations (56 coloured). Price: $12.

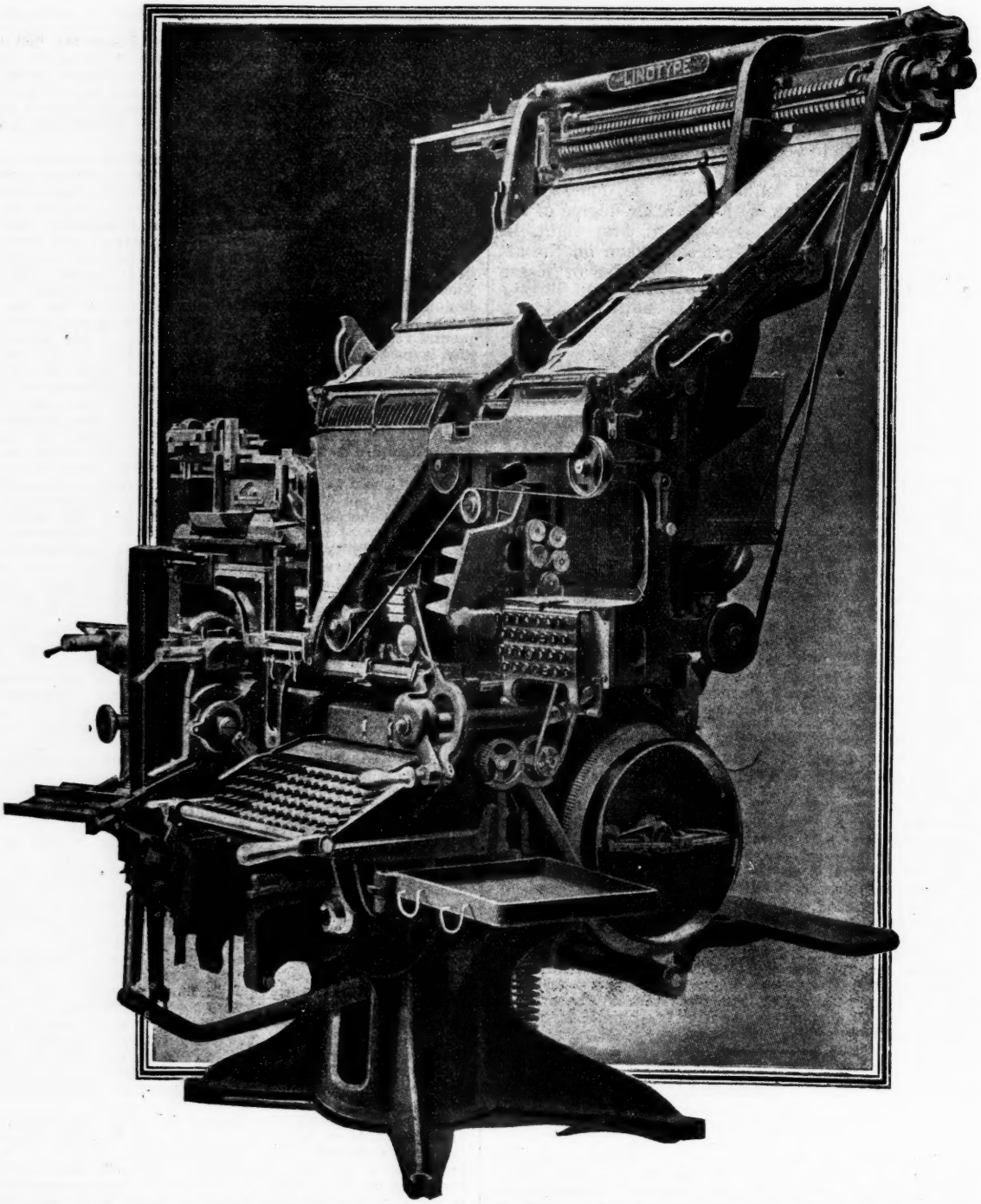


Illustration of the linotype machine used for the type setting of The Medical Journal of Australia. It is a Mergenthaler Model No. 14, the most modern and efficient type-setting machine in existence.

The Medical Journal of Australia

SATURDAY, OCTOBER 8, 1921.

The Development of the Journal.

Over seven years ago the Australasian Medical Publishing Company, Limited, was established for the purpose of owning and publishing a medical journal which should replace or incorporate the then existing two medical journals as the official organ of the Branches of the British Medical Association in Australia. The idea of the establishment of an official medical journal was not new. In the year 1896, Dr. L. E. Barnett asked the Intercolonial Medical Congress at Dunedin to discuss the possibility of founding an intercolonial medical journal. Difficulties existed at that time which seemed to the members of the Congress to be insuperable. Various proposals were put forward to render this proposition a practical one, but all met with stern opposition and for a time the suggestion was allowed to lie latent, until a more propitious set of circumstances might infuse life into the dormant scheme and enthusiasm into the advocates of a single official publication. Seventeen years later the Federal Committee of the British Medical Association in Australia had become an accomplished fact and the New South Wales and Victorian Branches of the British Medical Association had arrived at an agreement whereby the medical journals owned by each should cease to exist as soon as a company of members of the Australian Branches of the British Medical Association should have completed their preparations for the appearance of a new journal. The venture was an experiment. It was widely recognized that a journal was needed which might act as the common ground for the six Branches. The constitution of the Branches rendered it impossible for them to step in as owners collectively of this new paper. The basis of the idea was that no one Branch should have a greater interest in it than any other. Consequently, the Australasian Medical Publishing Company, Limited, was formed with three members nominated by each Branch. Of the three members, one was chosen to be the Director in the particular State. At that time it was difficult to predict the scientific or financial fate of the undertaking. The Company secured a small amount of money in return for debentures and The Medical Journal of Australia was launched on July 4, 1914, with this financial backing. All calculations and predictions made at the start proved wide of the mark, because no one had been able to take into account the world disaster which was destined to follow almost immediately on the foundation of the Journal. During the first year or two the Journal struggled through a hazardous period of initiation, until its business foundation was secured and its federal character gained recognition. No sooner had these primary difficulties been overcome than the effect of the war on industrial undertakings made itself felt and serious financial problems presented themselves to the Directors. The ever-increasing cost of paper and of printing necessitated repeated adjustments in the business arrangements of the paper. It was, however, clear from the year 1919 that The Medical Journal of Australia had become so firmly established that even the concomitants and sequelæ of war would not bring it into a condition of instability. The end of the war was not accompanied by any relief from financial embarrassment. On the contrary, prices tended upwards for a considerable time. The result of this was that, in order to avoid a financial loss on the publication pending the fall in the price of paper and a reduction in the high cost of labour, the Directors determined to reduce the size of the Journal. They felt that this decision was highly undesirable. The demand for expansion was present, but could not be met, either at once or in the immediate future. It was impossible to tell when the relief would come and, in the mean time, the official organ of the Branches would be unable to keep pace.

Two years ago the proposal was made that the Australasian Medical Publishing Company, Limited, should take a bold step in bidding for the development of its journal. The proposal was that the Company should acquire a modern type-

setting plant and emancipate itself from part, at all events, of the control of the independent printing firms. For seven years this journal has been excellently printed by Shipping Newspapers, Limited. This firm, however, is a commercial undertaking and its relations with this journal were business relations. The proposal seemed at first too enterprising to be justifiable, but little by little the advantages of the plan gained recognition. It was felt that, even if the actual cost of setting and composing the Journal were not materially reduced, the ownership of a linotype machine and the exclusive engagement of expert workers would enable the Company to expand the Journal and to lay a permanent and solid foundation for future development. In February, 1921, it was determined that a Mergenthaler linotype, Model No. 14, should be purchased. An illustration of this machine appears in this issue. The offices of the Journal have been transferred to the fifth floor of the British Medical Association Building, in Elizabeth Street, Sydney, and an up-to-date equipment for type setting and composing has been installed in adjoining rooms. No expense has been spared to render this publication a sample of high class printing art. The Sydney and Melbourne Publishing Company, Limited, is contributing to the result in machining the Journal. Attention has been paid to every detail, so that the reading may be pleasant and easy and the reproduction of illustrations of good quality.

This issue, the first wholly set up by the proprietors, represents the second stage in the experiment. The aim of The Medical Journal of Australia is to expand, to increase its sphere of usefulness and to reach a standard which may compare with that of the leading medical journals of the world. For a time the progress must necessarily be slow. Little by little it may be possible to secure the co-operation of expert workers from the many compartments of the field of medical science. With the growth of the staff, with wider organization and with the better co-ordination of the various departments of the undertaking the clinical, sociological and scientific branches will receive more effective treatment. It is hoped, as these activities are developed, that the medical profession in Australia will have every reason to be proud of its official organ.

THE PREVENTION OF DIPHTHERIA.

From time to time we have been compelled to call attention to the high incidence and high mortality of diphtheria. Diphtheria is largely a disease of children, but infection in adults is quite common. When a child becomes ill with the disease, at least one person is needed to attend to it. The acute illness lasts a week or longer in all but the mildest cases, while convalescence is often prolonged for several weeks. Thus, an infection in a child, terminating in recovery, means the withdrawal of at least one adult from his or her ordinary occupation for probably three weeks, the employment of a medical practitioner for a similar period, the use of a costly drug, namely, antitoxin, and a complete disturbance of the dietary arrangements for about a fortnight. From the economic point of view, each infection in a child or in an adult involves the loss of a considerable sum of money. A low estimate of this loss would be £12 for one infection. The monetary loss to the family and to the State caused by a death from diphtheria should be estimated at not less than £150 a year for the whole of the active life of an average citizen, that is, for forty years, or £6,000. In the year 1920 there were notified to the authorities in the Commonwealth no less than 18,183 infections, of which 805 proved fatal. Calculated at these low estimates, the non-fatal infections would represent a loss of £200,000, while the fatal infections would mean a loss of £4,800,000. In one year diphtheria, a preventible disease, cost the Commonwealth £5,000,000!

Twenty years ago the incidence of diphtheria varied between 0.1% and 0.15%; in 1920 it was 0.33%! About twelve years ago it seemed as if some agents were acting in reducing the incidence, but the reduction was ephemeral and could not be traced to any organized plan of attack by the custodians of the public health. The statistics reveal that the incidence varied irregularly in all six States and that in none was the infection held at bay. There is evidence to show that medical practitioners throughout the Commonwealth frequently neglect their statutory duty of notifying every infection. In a few instances a notification is sent to the authorities concerning a person carrying diphtheria bacilli, but not exhibiting signs of infection;

but there is reason to believe that this form of notification is numerically small, while the infections not notified are at least as numerous. Formerly incorrect diagnoses and carelessness in assigning the correct cause of death probably vitiated the mortality figures considerably. To-day it may be assumed that death certificates in cases of diphtheria represent approximately the fatalities from the disease. It is remarkable that the case mortality, calculated from the number of infections notified, varies but little from year to year or in the several States. Within the past few years it has been between 4% and 6%.

Epidemiologists have been at great pains to discover the cause of the local and temporal variations in the incidence of infective diseases. These studies are undoubtedly of considerable importance, but, unfortunately, they have not led to the discovery of many relevant facts. It is known that bacteria and protozoa undergo a slow process of evolution. In view of the rapidity of multiplication of bacteria, it would be reasonable to assume that biological changes of a very definite type take place during the course of a few years. The influence of the host on an invading pathogenic organism cannot be disputed, neither can it be denied that the bio-physical qualities of bacteria become altered as a result of a changed environment. These evolutional changes, resulting from unusual nutrient and unusual biological reactions on the part of the host, are obviously not the sole cause of the natural increase or decrease of prevalence of any given infective process. Otherwise, it would be impossible for an epidemic to run a long course without any modification of the quality of the illness. That this occurs is common knowledge. One of the most remarkable instances of this occurrence is the mild variola outbreak in New South Wales in 1913-1914. Individual susceptibility, racial susceptibility, fixed degree of virulence of the strain of infecting organism, enrichment of the infecting organism from without and similar factors are probably concerned in the determination of incidence. The effect of meteorological factors is uncertain and too speculative to warrant a definite statement. Concerning the influence of earth tides and other geological phenomena on epidemics, nothing whatever is known. It may therefore be assumed that, while the fact is established that the incidence of diphtheria, like that of other epidemic diseases, varies in accordance with certain natural laws, the present state of our knowledge is wholly insufficient to enable us to apply influences to modify the frequency. The prophylaxis of diphtheria must therefore proceed along other lines. Fortunately, we can afford to ignore the natural curve of incidence. It has been shown that it is relatively easy to arrest the course of a localized epidemic by the ordinary methods of tracing the "previous case," of keeping under strict control all individuals who have had any personal communication with the patient or patients from the moment of the appearance of the first signs of illness and of the effectual isolation of all infective persons. It is often stated that the carrier state in connexion with diphtheria bacilli is so common that isolation of all persons harbouring virulent bacilli becomes a practical impossibility. Not every so-called "carrier" is a real danger to the community. It may be unnecessary to insist on strict isolation in all instances, provided that the individuals concerned can be induced to remain under supervision and to obey instructions, both in regard to local treatment and in regard to the avoidance of intimate contact with children. That the systematic application of these preventive measures suffices to stem an epidemic has been demonstrated in our own country. If it can be achieved with a small expenditure of time, energy and money on a small scale, it must be possible on a large scale. To rid the six Australian States of diphtheria would necessitate an elaborate and well organized campaign. It would cost a large sum of money, but not so large a sum as diphtheria itself costs the community. It might involve co-ordinated work, spread over several years. But it would be worth while doing.

The 18,183 infections in 1920 indicate that in none of the States is even a limited campaign being carried out with the object of preventing diphtheria. It is useless to require a sanitary inspector to look at the drains of a house from which a notification is sent. The prophylaxis of diphtheria is not a sanitary matter and the sanitary inspector is not needed for this task. We would suggest that the Federal

Department of Health should undertake an educational experiment in a town of moderate size. The plan would need to be carefully prepared; a staff of medical officers would have to be engaged for the purpose and the services of the general practitioners in the district would have to be requisitioned. The experiment should extend over a period of not less than one year. If, as we maintain, diphtheria is preventible, the fact should be demonstrated on a sufficiently large scale to convince even the most sceptical.

SYPHILIS IN INFANTS.

The subject of syphilis in infants has occupied the attention of the Section for the Study of Diseases of Children of the Royal Society of Medicine during two of its sessions. The discussions were planned to cover the subjects of the diagnosis and the treatment of congenital syphilis, but it became evident from an early stage that, while these two themes were too extensive for a thorough and exhaustive debate, the term congenital syphilis was too restricted to permit of useful opinions being expressed. It is obviously impossible to reproduce, even in a summarized form, all the views put forward in this discussion Some of the more important points will be reviewed.

The debate[1] was opened with a learned dissertation by Sir Humphry Rolleston, K.C.B.. His remarks on the influence of congenital syphilis in favouring the onset of other infections, in leading to changes in the endocrine glands and in relation to syndromes not usually regarded as due to syphilis, are highly suggestive and interesting. This part, however, must be left untouched for the present. Sir Humphry first examined the value of the Wassermann test as a means of diagnosis of congenital syphilis. It should be pointed out that the jargon of the laboratory, having come into general use among medical practitioners, has tended to introduce a fallacy which should be removed as promptly as possible. The Wassermann test is employed for the purpose of demonstrating whether the serum or cerebro-spinal fluid of a given person in the presence of a suitable antigen does or does not deflect complement from the ordinary hæmolytic system. If the complement is deflected, it is spoken of as a reaction. A "positive reaction" is pure tautology. On the other hand, the failure of the serum or fluid to prevent the hæmolysis may be due to several entirely different sets of circumstances. Under certain conditions, this failure might be indicative of the absence of a syphilitic infection, but, as nearly every fluid, other than the serum or cerebro-spinal fluid of a syphilitic. will either favour hæmolysis or fail to interfere with the hæmolytic reaction, it is quite impossible to distinguish between the several kinds of failure. In any circumstances, when no deflection of complement takes place, there is no reaction. It is absurd to speak of a "negative reaction." It is misleading, in that it leads persons of an uncritical nature to assume that the failure is something as definite as the reaction. In discussing this question, Sir Humphry came to the conclusion that it was impossible to accept as absolute the proposition that, in the presence of syphilitic stigmata, failure on the part of the patient's serum to deflect complement eliminated the possibility of an existing syphilitic infection.

Mr. O. L. Addison, viewing the subject from the pedestal of the surgeon, arrived at a curiously guarded conclusion. He held that the chief factor of successful diagnosis was "to be on the watch" for the signs of syphilis, which he described as the most efficient masquerader of all diseases. Once suspected, syphilis could be diagnosed by the results of treatment, with or without the aid of the Wassermann test. While he found that Hutchinson's teeth, deafness and interstitial keratitis were rare manifestations of congenital syphilis, he had been impressed by the frequency of osteo-myelitis and periostitis.

Dr. Leonard Findlay dealt very fully with the results of the Wassermann test applied in over one thousand cases of illness in infants. In undoubted congenital syphilis a reaction had been obtained in all but two infants out of 163, *i.e.*, 98.77%. When the diagnosis was probable congenital syphilis, the test yielded a reaction in 75%. A reaction was obtained in 21% of children suffering from symptoms not definitely due to syphilis, although there was suspicion of syphilis on account of the history. Lastly, not one child suffering from conditions not caused by syphilis harboured the syphilitic antibody in its serum. In the next place, the serum of the mothers of syphilitic infants gave a reaction in 88%, while that of mothers of non-syphilitic infants was quite inert. These, together with other remarkable observations, led him to enunciate the view that he would require very strong clinical proof in the absence of a reaction before he would accept the diagnosis of congenital syphilis. He maintained that a reaction spelt syphilis. In an overwhelming proportion of cases, failure of the serum to cause a reaction meant freedom from syphilitic disease.

Dr. David Nabarro voiced the opinion that a "strong" Wassermann reaction always meant syphilis. He warned his audience, however, that the reaction did not signify in every case that a particular lesion was syphilitic. Failure to react did not always preclude syphilis. His experience had taught him that it was not easy to alter the power of the serum of a congenital syphilitic to deflect complement. Out of a series of 62 infants whose serum gave a reaction, the antibody disappeared in only 14, while in five of the 14 the serum subsequently regained the power to cause a reaction.

Dr. Amand Routh pointed out that the ovum infected at fertilization or soon after was apparently not affected by the disease until late in pregnancy. It had been shown that ante-natal treatment of the mother, even as late as the seventh or eighth month, very frequently resulted in a seemingly healthy in-

[1] *Proceedings of the Royal Society of Medicine*, June, 1921.

fant at birth. The ovum was infected by the early granule stages of the mature spirochætal organism. Noguchi had reared these granules and had seen them sprout and develope into mature spirochætes, capable of infecting monkeys and rabbits. The organism was kept in a latent stage in the embryo by syncytial toxins or chorionic ferments. While these ferments were present, the serum of the fœtus did not deflect complement. When the mother was treated, the infant might be born apparently healthy, but the ferments would have disappeared and its serum would give a Wassermann reaction.

Dr. Morley Fletcher held that failure of a serum to react might be due to absence of infection, to an infection having died out, to latency of spirochætes lurking in some tissue or to the presence of the spirochætes in the granular or similar stage.

Many of the speakers referred to the frequency of the late appearance of syphilitic signs in infants. From the general tenor of the remarks on this point, it would appear that more evidence is required before actual congenital syphilis and syphilis contracted at or soon after birth can be differentiated. Again, no rational explanation was adduced for the healthy child born after a series of infants with signs of congenital infection and before further syphilitic infants. Dr. Leonard Findlay was regarded as extremely optimistic when he stated that his experience had taught him that adequate antenatal treatment had resulted in 100% of healthy children and that by its means still-births and miscarriages could be prevented.

The majority of other speakers, while admitting that good results were obtained from ante-natal treatment, did not agree that healthy children could be guaranteed. Dr. Findlay had found that treatment after birth was unsuccessful in only 8% of children under one year of age. Far less satisfactory results were attained when the treatment was started after the child had reached the age of one year. In contrast to this opinion of Dr. Findlay, that of Dr. J. E. R. McDonagh may be cited. He held that, while the child was apparently healthy when the mother had been thoroughly treated during pregnancy, it was in reality still syphilitic. Often late symptoms appeared. This view is unlikely to find acceptance among those experienced in the treatment of infants. The keynote of antenatal, as well as post-natal, treatment would seem to be fearlessness in giving both arseno-benzol drugs and mercury in full doses.

ALBUMINURIA.

The presence of albumin in the urine is necessarily an indication of a more or less serious disturbance of the renal epithelium. Clinicians usually form an opinion in regard to the prognosis of conditions associated with albuminuria according to the accompanying signs of gross renal lesions or of circulatory changes within the kidney. When there is evidence of acute or chronic nephritis, the investigation is carried further to ascertain the exact form of the lesion. The involvement of the parenchyma can be measured by indirect means and a more or less accurate estimate can be made of the efficiency of the renal epithelium. On the other hand, it is extremely difficult to gauge the significance of albuminuria unaccompanied by signs and symptoms of gross renal defects. In individual instances it may be possible to form a reliable prognosis, provided that much care is taken and prolonged observations are carried out. Often, however, the clinician has not sufficient data on which he can predict the course of the affection manifested merely by a small amount of albumin in the urine. This question has been attacked from the point of view of the life insurance statistician by Louis I. Dublin.[1] He made an endeavour to trace the fate of proponents for life insurance who were rejected on account of the presence of albumin, with or without casts, in the urine. The plan he followed was to compare the actual mortality for the various age periods with the actuarial expectation of life for the same group of healthy persons. He found that the duration of life of persons with albumin, but no casts, in the urine was considerably shortened in all age groups up to 65 years. The average increase of mortality was 1.8 times. A closer study revealed that when the amount of albumin was a "faint trace," the duration of life was not shortened in persons between the ages of 15 and 24 years. A slight shortening occurred in the higher age periods up to 55 years. On the other hand, when there was a "trace" of albumin in the urine, the deaths were twice as frequent as those of the corresponding groups of healthy persons. When the albumin was associated with casts in the urine, the seriousness of the condition was greatly increased. The only exceptions to this was in the case of young persons between 15 and 24 years with a "faint trace" of albumin and some casts. In this group the actual mortality was 91% of the expected mortality. The same age group classified under the rubric "trace of albumin with casts" yielded a mortality of 256% of the expected mortality. When the quantity of albumin was moderate or large, the mortality was 545% of the expected. The highest mortality was found in persons between the ages of 45 and 64 years with moderate or large quantities of albumin and casts in the urine. It was 620% of the expected. Mr. Dublin states that, although the data were insufficient to produce exact figures, he was able to determine that granular casts seemed to indicate a graver state than hyaline casts. The lesson to be drawn from this actuarial study of the presence of albumin and casts in the urine is that this symptom is always to be regarded as serious, save in young people with "faint traces" of albumin. The presence of albuminuria in young people is so frequently associated with tuberculosis that clinicians should not neglect to investigate this point, if a young patient with an otherwise unexplained albuminuria presents himself for examination. It must be remembered that the determination of the significance of a pathological sign or symptom in a proponent for life insurance is more difficult than that in a patient, because the latter is always aware of a disturbance of his health.

[1] *The American Journal of Hygiene*, May, 1921.

Abstracts from Current Medical Literature.

THERAPEUTICS.

(155) Chenopodium in Hookworm Disease.

Samuel T. Darling and Wilson G. Smillie (*Journal of the American Medical Association*, February 12, 1921) report a series of cases of hookworm infection in which the patients were treated with chenopodium. The object of the authors' investigation was to determine the value of preliminary purgation and starvation as an adjunct to the drug treatment. The experiments reported were carried out on a coffee plantation, under conditions in which hookworm infection is prevalent amongst the inhabitants: an unprotected water supply, absence of latrines, colonists living in groups of houses, two families to a house and from twenty to thirty houses in each colony. The method of investigation employed comprised a preliminary trial treatment, after which all stools were kept and worms counted and classified. Ten days later a test treatment was given, to remove all remaining hookworms, and a comparison of the results was made. In the routine employment of chenopodium as a vermifuge, 3 c.cm. is regarded as the maximum adult dosage. The doses commonly employed are 1.5 c.cm. for adults, with graded doses for children. It is recommended that two doses be given, the second one hour after the first, in freshly prepared hard gelatine capsules. The last capsule is followed in two hours by a purge. It was found that if this treatment were given twice, at an interval of ten days, more than 97% of all hookworms were removed with slight inconvenience to the patients. From their investigations the authors concluded that a preliminary purge did not add to the efficiency of the treatment with chenopodium when the drug was given in two doses of 1.5 c.cm. in the case of an adult. A preliminary starvation period was not necessary in the treatment; on the contrary, the efficiency of the drug was lessened by starvation. A small amount of food given coincidently with the drug, when the divided doses of 1.5 c.cm. were given, greatly diminished the efficiency of the drug in the treatment of hookworm disease. With the smaller doses of chenopodium which were given to children, the decrease in efficiency of the drug caused by the factors of preliminary purgation and starvation and the coincident taking of food, was much more striking than with the full adult dose of 1.5 c.cm..

(156) Bromides in Digestive Disturbances.

P. M. Besse and P. Coutzait (*New York Medical Journal*, April 20, 1921) discuss the utility of the administration of bromides in disturbances of digestive function. Although the sedative action of bromides upon the psychic and motor functions of the central nervous system has long been recognized, opinion has been generally unfavourable to the use of alkaline bromides for affections of the alimentary system. The authors conclude that this prejudice exists because the potassium salt chiefly employed has been the alkaline bromide, which exercises an irritating effect upon the gastro-intestinal mucosa. It is stated that sodium bromide has proved completely efficient without ill-effects resulting. The mechanism of the action of this drug in affections of the digestive tract is said to be complex and as yet incompletely elucidated. Besides the general sedative action upon the central nervous system, there is said to be a moderation of the hyperæsthesia of the gastro-intestinal mucous membrane, causing modification of exaggerated secretion, diminution of the rapidity of transit and suppression of primary or secondary spasmophilia. In place of a simple aqueous solution of sodium bromide the authors employ a prepared cube, which is on the market under the trade name "Sedobrol," containing 1.1 grammes of sodium bromide, associated with vegetable extractives and flavouring. It is recommended that this be administered in half a cupful of very hot water, which forms an acceptable and elegant method of exhibiting this drug. The concomitant diminution of the intake of common salt should be remembered in connexion with this, as in all forms of bromide administration.

(157) Iodine in the Cerebro-Spinal Fluid.

Earl D. Osborn (*Journal of the American Medical Association*, May 21, 1921) reports investigations with regard to the normal occurrence of iodine in cerebro-spinal fluid and to the effects produced in this medium by the oral, rectal and intravenous administration of iodides. By a refined technique, using the method of Kendall for the detection of iodine, the author has demonstrated that the average iodine content of normal cerebro-spinal fluid amounts to 0.018 mgm. in each 100 c.cm.. A series of observations was made in the cases of patients to whom potassium iodide had been administered in amounts ranging from 2.6 to 6.6 grammes *per diem*. The results appeared to indicate that a parallelism existed between the concentration of iodine in the blood and in the cerebro-spinal fluid, a maximum having been reached from two to three hours after administration. Following the intravenous injection of 100 c.cm. of a 10% solution of sodium iodide, a maximum concentration in the cerebro-spinal fluid was reached in from one-half to one hour after injection. The author concludes that iodine is present in the cerebro-spinal fluid of normal individuals. Iodine in increased amounts is present in the cerebro-spinal fluid following administration of iodine by mouth or by rectum or by intravenous injection, the increase being much greater when the drug has been administered by the intravenous route. Observations made in the course of this study have suggested the possibility that neuro-syphilitic tissue takes up more iodine than normal nervous tissue and that the presence of meningitis increases the permeability of the meninges to iodine compounds in the blood.

(158) Exercise and Rest in Diabetes.

The effects of exercise on mild and severe cases of *diabetes mellitus* has been the subject of a series of experimental investigations by F. M. Allen and M. B. Wishart. These authors publish the results of their experiments with diabetic dogs (*American Journal of the Medical Sciences*, February, 1921). They found that in mild diabetes exercise diminished the hyperglycæmia and glycosuria, whereas at an advanced stage exercise was unable to modify these evidences of the pathological state and in extreme forms of diabetes exercise actually increased the glycosuria. They conclude that the increased metabolism of exercise does not impose an added strain upon the internal pancreatic function. For the purposes of treatment the combustion of food by exercise is preferable to its deposit in the body, but the combustion of calories by exercise is not as beneficial as their omission from the diet. In diabetes with under-nutrition heavy exercise involves fatigue, but light exercise aids health. Rest is necessary in the severest cases.

(159) Pituitrin in Diabetes Insipidus.

R. B. Gilson and F. T. Martin (*Archives of Internal Medicine*, March 15, 1921) have reported the effects produced by the administration of pituitrin and histamine on a patient suffering from a severe form of *diabetes insipidus* and chronic syphilis. A subcutaneous injection of 1 c.cm. of pituitrin caused a temporary decrease in the volume of urine, with an increase in concentration. The general condition and comfort of the patient were much improved. The injection of 0.2 mgm. of histamine produced similar effects on the urine, but caused such discomfort and prostration that only one dose was administered. Desiccated whole pituitary gland, given in the dose of 3 grm. by mouth, produced an immediate slight reduction in volume, with increased concentration of urine. The effect of the injection of 1 c.cm. of pituitrin on the nitrogenous metabolism was to cause a diminished elimination, with definite retention of nitrogen.

UROLOGY.

(160) Subtotal Cystectomy.

M. Nicolich (*Journal d'Urologie Médicale et Chirurgicale*, November, 1920) describes an operation for extensive carcinoma of the bladder, which he has performed three times. This particular operation is suitable for extensive malignant growths involving practically all the bladder ex-

cept the trigone and ureters. Extraperitoneally (and partly intraperitoneally where necessary) the whole bladder is removed, with the exception of the trigone and a very little of the adjoining wall. This small open remnant of the bladder cannot be sutured to form a cavity, so it is left open. The abdominal wound is left almost completely open. Iodoform gauze packing is placed between the trigone and the peritoneum and between the bladder stump and the surface. An indwelling catheter is tied in, to assist in the drainage of the trigonal stump. In one case the patient (now 80 years old) is alive and well, eight years after the operation, and evidently has a moderately large newly-formed bladder. He only has to urinate five times in the day and twice at night. The second patient also developed a new bladder and did very well until eleven months after the operation, when he died of bilateral pyelonephritis. In the case of the third patient, the suprapubic cavity quickly became filled with adherent phosphatic deposit. The wound would not close and the patient died on the fifteenth day. The ideal after-treatment is to leave catheters draining the trigonal area through the urethra for three to four weeks. The suprapubic tampon is discarded after three or four days. The new bladder cavity is formed at the expense of the surrounding tissues and the author states that muscle fibres were found in the new wall in one of the two fatal cases.

(161) Examination for Spermatozoa.

M. Huhner (*New York Medical Journal*, May, 1921) describes his own practical experiences in the search for spermatozoa when he was engaged in the diagnosis or treatment of sterility. Time-consuming and over-scientific technique is inapplicable to such a practical problem. The methods which may be used are: (*a*) examination of condom specimens, (*b*) massage of the vesicles, (*c*) aspiration of the testicle and (*d*) examination of the secretions in the female genital organs after coitus. The latter method, the Huhner test, serves most purposes and is obviously very free from error in the diagnosis of live spermatozoa. If only dead sperms are found on or in the cervix, a condom specimen should be examined. Living spermatozoa are often killed quickly by the unfavourable reaction of the vaginal or cervical secretions. Acidity of the latter may be corrected with a bicarbonate douche before coitus. The Huhner test may then reveal living sperms. It is of prime importance to make a thorough gynæcological examination of the female and a genito-urinary study of the male. It should be remembered, however, that time should not be spent on correcting lesions or malformations which are unlikely to be the cause of the sterility.

(162) The Phenol-Sulphone-Phthalein Test.

Braasch and Kendall (*Journal of Urology*, February, 1920) discuss possible extra-renal factors influencing the phthalein output. It is considered that the effects of retention of the dye in the tissues and of cardiac insufficiency are best avoided by injecting the dye intravenously. Patients undergoing preparation for prostatectomy will frequently show a low phthalein output after intramuscular injection, but the output is good or even normal after intravenous injection in the same cases. With true nephritis, entailing actual destruction of kidney cells, the kidney function is lowered with either method. Phthalein is retained in the tissues in acidosis. If the tissues are rendered alkaline by oral administration of sodium bicarbonate, the phthalein is readily liberated and so excreted. Cardiac insufficiency leads to diminished phthalein output. With rest in bed and appropriate cardiac stimulants the dye output rises, provided there is no renal disease. Care must be taken in such cases to inject the dye intravenously.

(163) Syphilis of the Bladder.

A. Boeckel (*Journal d'Urologie Médicale et Chirurgicale*, November, 1920) describes a case of syphilis of the bladder in a woman of 31 years. This patient was sent to the author with a diagnosis of gonorrhœal cystitis complicated by bilateral pyelonephritis. With the cystoscope it was found that the neck and trigone of the bladder were very congested. The ureteric orifices were normal, but pus was obtained from each kidney. The right peri-ureteral region of the bladder, as well as the *bas fond*, was studded with rounded and oval erythematous plaques. The centre of each plaque was uniformly pink and the edge a deep red, contrasting vividly with the surrounding mucosa. Similar lesions have not been described before, syphilitic manifestations in the bladder being, as a rule, ulcerative (tertiary). The author, however, suspected syphilis and a Wassermann reaction confirmed his suspicions. Under specific treatment the vesical lesions improved and finally disappeared altogether. The kidneys were treated by lavage of the pelves.

(164) Pyelo-Lithotomy.

E. Christian (*Journal d'Urologie Médicale et Chirurgicale*, March, 1921) describes a modified technique of pyelo-lithotomy which permits the performance of this operation in preference to nephro-lithotomy in a greater percentage of cases of renal calculus. The essential modification is that to the usual longitudinal incision on the posterior aspect of the pelvis is added a short transverse incision running at right angles from the upper end of the first incision and stopping short of the kidney substance. Peri-nephritic fibrosis or fibro-lipomatous peri-pyelitis does not deter the writer from attempting to expose the pelvis. The angular incision in the latter gives free access to the calyces, as well as the pelvis, and allows the insertion of two fingers instead of one. One suture in the transverse wound is sufficient; the remainder of the flap falls naturally into place. By the use of this technique, nephro-lithotomy, with its attendant disadvantages, may very often be avoided.

(165) Pyelography in Renal Calculus.

E. Papin (*Journal d'Urologie Médicale et Chirurgicale*, February, 1921) demonstrates the value of pyelography in an accurate determination of the position of calculi in the kidney. If the relation of a calculus shadow to the pelvis or one of the calyces can be determined before operation, the nature of the surgical procedure may at once be decided—pyelo-lithotomy or nephro-lithotomy. Moreover, at the operation, armed with accurate knowledge, the surgeon need not search, but may cut down directly on the stones, whether through the pelvis or the cortex. Without pyelography the exact localization of renal calculi is nearly always impossible. The relation of the shadow to the vertebræ is a useless guide. Where the kidney shadow is well seen in the skiagram, however, fairly exact localization of the calculi may be made. The technique followed by the author is to make a plate before the injection; then a second plate is exposed immediately after the injection of 30% sodium bromide.

(166) Transvesical Ureteric Catheterization.

L. Phelip (*Journal d'Urologie Médicale et Chirurgicale*, February, 1921) discusses the technique of catheterization of the ureters through the open bladder. This manœuvre is occasionally necessary when cystoscopy is impossible by reason of a very irritable or contracted bladder. With the technique generally used, however, the open catheterization is very often difficult. The incision in the bladder should be prolonged a little forwards, so as to permit of the application of a flat metal retractor blade as far down as the vesical neck. This blade flattens out the vesical floor by its pull and by means of the light which it reflects from the windows or a lamp lights up the trigone so that the ureteric orifices are well seen. The ureters may then be catheterized with ease.

(167) Bilharziosis of the Bladder.

Diomede Petillo (*Surgery, Gynecology and Obstetrics*, April, 1921) reports a case of bilharziosis in which treatment by Christopherson's method was successful. In this method 0.03 gramme of antimony tartrate in 3 c.cm. to 4 c.cm. of normal saline is injected intravenously each day for several days and then every second day. The original dose is increased by 0.03 gramme at each injection until a maximum of 0.12 gramme to 0.15 gramme is reached. In the complete cure 1.3 grammes to 2.0 grammes are used. The aim is to kill the parent worm in the portal venous system and to sterilize the ova in the different organs in which they lodge. The result is stated to be excellent.

British Medical Association News.

SCIENTIFIC.

A meeting of the Victorian Branch was held in the Medical Society Hall on July 6, 1921, the President, Mr. Basil Kilvington, in the chair.

Mr. Victor Hurley, C.M.G., read a paper entitled "On the Indications for Blood Transfusion and the Methods for Testing the Blood of Donors" (see page 275). At the end of the lecture he gave a demonstration of the technique employed by him in transfusion of blood.

Mr. Alan Newton demonstrated by means of apparatus and lantern slides the technique of blood transfusion.

Mr. W. Dismore Urjohn, O.B.E., read a paper entitled "Observations on Blood Transfusion" (see page 279).

Dr. A. Norman McArthur, in opening the discussion, expressed regret that he had been unable to be present in time to hear Mr. Hurley's paper. He had been much impressed by a former paper in which Mr. Hurley had discussed blood transfusion in relation to surgical shock and he was anxious to learn if there had been any advance in the practice of blood transfusion since then. In that paper he had dealt with blood transfusion under war conditions, when donors were systematically grouped, were always available and were under control. Some approach to this system might be secured in civil hospital practice, but in private work difficulties were encountered in obtaining as a matter of urgency suitable donors.

Dr. McArthur indicated that in his own special work sudden and severe hæmorrhage, demanding the prompt measures appropriate to a grave emergency, was prone to occur. There was no time to embark on a hurried search for donors if the occasion could be anticipated by having previously tested donors available. This, of course, was practicable in hospital work; but the prompt acquisition of a suitable donor in private practice was a very real difficulty in dealing with those cases in which urgency was the paramount consideration. The difficulty would continue until such time as a system of co-operation was devised under which individual practitioners would be advised as to where a suitable donor might be obtained in an emergency.

In conclusion, Dr. McArthur asked if anyone had any suggestions for the solution of the difficulty he had discussed.

Dr. J. Leon Jona referred to a point emphasized by Mr. Newton, *viz.*, the strict necessity, when employing the citrate method, to use perfectly fresh distilled water. He was of opinion that fresh distilled water was not an absolute necessity. It had been his good fortune to be at the Lister Institute at the time when Hort and Penfold were conducting their investigations into the causes underlying the untoward results which sometimes occurred after intravenous injection; he gathered that the workers named had concluded that the dangers lay in distilled water rather than in tap water. The explanation advanced was that the calcium ions present in tap water were antagonistic to the particular toxin which precipitated the rigors and other features of bad after-effects.

It might be mentioned, in passing, that distilled water for use in intravenous injection should always be distilled from glass vessels in preference to copper. Copper poisoning had been known to attend the use of water distilled from the latter type of vessel.

Dr. Jona agreed that the problem of which Dr. McArthur had spoken constituted an obstacle to the performance of immediate blood transfusion in private practice. Cold storage of Group IV. blood had been resorted to, but, as far as he knew, it had not been attempted commercially. In cases of extreme urgency he would prefer to use gum saline solution and avoid the loss of time consequent on obtaining and determining a suitable donor.

Mr. Balcombe Quick expressed his appreciation of the thorough manner in which the authors of the papers had traversed the subject of blood transfusion.

Dr. Jona's remarks recalled to him a case in which he also had had reason to believe that fresh citrate solution was not absolutely essential. The particular patient in that instance was very jaundiced and he had occasion to perform the operation of trans-duodenal choledochotomy and later to carry out transfusion of blood four times, on account of continued hæmorrhage. On the first two occasions the citrate solution had been prepared several weeks previously, but fresh citrate was employed for the remaining two transfusions. In the latter two severe rigors followed the injection of citrated blood, whereas no ill-effects were observed on either of the first two occasions. It therefore appeared that factors apart from the freshness of the citrate must be invoked to explain the occurrence of undesirable reactions, at least in some instances.

The patient to whom he had referred, also furnished some interesting observations on the duration of hæmostatic power conferred by transfusion of blood. On each occasion the hæmorrhage was checked for about 48 hours, only to recur until, at the fourth transfusion, it was checked completely.

With reference to the use of untested blood, Mr. Quick remarked that the risk of a fatality from this source appeared to be remote. Mr. Hurley had quoted Crile's figures bearing on this point and to resort to untested blood in an emergency seemed a fair chance to take. He had carried out transfusion without testing on a considerable number of occasions in France and had experienced only one catastrophe in which the fatal result appeared to be due directly to incompatibility between the blood of the donor and of the recipient. Where circumstances necessitated the use of untested blood it was wise to introduce 60 c.cm. to 90 c.cm. and to wait for four or five minutes. If any ill-effects were apparent, it was then not too late to desist and thus to avert disaster.

Mr. Quick added some remarks relative to the rate of administration in blood transfusion. If the flow were too rapid, the patient was apt to be distressed and to complain of præcordial pain and a sense of constriction in the chest. These unpleasant effects could be averted by giving the injection more slowly. It was a wise plan to consult the patient, when possible, as the transfusion progressed.

He had seen only one instance of complication in a donor; in this case there was a simple thrombosis at the site of venesection, which subsequently gave rise to symptoms of a pulmonary embolus.

Dr. Sydney Pern asked, relative to Mr. Hurley's statement that the life of red blood corpuscles was about thirty days, whether there were any observations to show that corpuscles were destroyed before their natural term of life when introduced into a subject with pernicious anæmia.

Dr. S. W. Patterson contributed to the discussion which had centred round the preparation of the citrate solution. He recalled the work of Dr. C. J. Martin, directed towards the simplification of the technique of blood transfusion. Dr. Martin had found that samples of sodium citrate obtained from different dispensaries contained varying amounts of water; consequently, the amount designed by weight to make an isotonic solution might not always give this result. It was advisable to make preliminary laboratory tests of the citrate solution in order to be sure that it caused no hæmolysis of suspended corpuscles.

In blood transfusion work even slight degrees of hæmolysis might cause trouble of the nature of undesirable reactions. Recent observations by a Japanese worker at the Lister Institute were of great interest, as bearing on the effect of introducing into the circulation corpuscles which had undergone any degree of hæmolysis. In the work referred to blood was withdrawn from an animal and its own corpuscles re-introduced; it was shown that, as long as there was no hæmolysis, the animal suffered no ill-effects; but the intravenous injection of even a slightly hæmolysed corpuscular suspension led to a febrile reaction. It appeared, therefore, that for blood transfusion it was necessary to secure that the corpuscles should be non-hæmolysed as well as compatible.

Dr. Patterson added some remarks on the risk of untoward results incurred by running in the blood too rapidly. It was a serious risk in patients with grave anæmia and the associated fatty myocardium and great care was necessary to prevent over-distension of the right ventricle.

In discussing the utility of blood transfusion in grave anæmia, Dr. Patterson referred to investigations which had shown that quite small infusions of blood might have a beneficial effect. It appeared that it was not always

necessary to put the blood directly into a vein, but that small amounts injected intra-muscularly had given good results, presumably by providing a stimulus to the bone marrow.

In normal health a very constant condition as regards the amount of hæmoglobin and number of red blood corpuscles was maintained in the blood. Mr. Hurley had mentioned that the average life of a red blood corpuscle was estimated to be thirty days. In other words, one-thirtieth of the corpuscles had to be replenished each day and there must be some stimulus to the bone marrow normally operative, in order to make good the daily loss. Lack of oxygen was probably only one factor in this stimulating effect which was carried by the blood; preference should be given in the treatment of anæmia to blood transfusion rather than injections of gum-saline solution, because of the twofold effect of supplying oxygen and of providing a stimulus to the bone marrow.

Dr. N. Hamilton Fairley, O.B.E., emphasized the danger attending the rapid introduction into the circulation of substances of the nature of blood, serum or gum-saline. He recollected an instance in which a fatality supervened within a quarter of an hour of the injection of gum-saline solution; it was without doubt to be attributed to the fact that a large injection had been given under a 150 cm. head of pressure. Death was due to failure of the right side of the heart, owing to the inability of the right ventricle to propel the increased volume of fluid through the capillary bed of the lung. The work the right side of the heart had to perform under such circumstances was dependent on the quantity of fluid introduced intravenously and on its viscosity. As the pulmonary arterioles possessed no vasomotor mechanism, a conservative reflex dilatation, with lowering of the pulmonary peripheral resistance, appeared impossible.

In conditions such as ulcerative endocarditis and pernicious anæmia there existed profound changes in the myocardium and it was imperative that fluids of the viscosity of those he had mentioned, should be introduced into the vascular system slowly.

Dr. H. Douglas Stephens said that in the complete exposition of the subject of blood transfusion which had been given by the readers of the papers, he had been especially interested in the account provided by Mr. Upjohn of transfusion in children.

In regard to the practicability of the several methods when applied to children, he thought that the citrate method was undoubtdely the best; direct arm-to-arm transfusion was not a practical measure, on account of the very great difficulties in technique with small vessels and the paraffin tube method was not so readily carried out as that by which the blood from the donor was received into a solution of sodium citrate.

Certain difficulties arose, however, in the employment of the indirect citrate method among children. In the first place, it was often extremely difficult to select a vein which would carry the cannula in an exsanguinated infant. Resource might be had to the superior longitudinal sinus, but although he had frequently withdrawn blood for the Wassermann test from this source and had utilized it for the intravenous injection of saline solution, he had not hitherto ventured to introduce blood or novarsenobillon by the sagittal sinus. A vein suggested and utilized by Bruce Robertson was the internal saphenous vein over the inner malleolus.

Again, the cannula having been successfully inserted in the vein of the recipient, it was not uncommon to experience trouble in inducing the blood to run. A considerable time, perhaps half an hour, might elapse before a steady flow of blood was established. There appeared to be a closure or constriction of the veins in exsanguinated children, which frequently occasioned considerable embarrassment in the transfusion of blood. He wished to hear an expression of opinion as to the height from which it would be safe to introduce the blood.

In some remarks on the subject of hæmorrhage in the new-born, Dr. Stephens said that his experience was that very good results attended the transfusion of blood in this condition, but it was not necessary to administer the blood intravenously. Neither were large quantities necessary, but it was sufficient to withdraw 10 c.cm. to 30 c.cm. by means of a record syringe from the donor and to inject it into the infant either subcutaneously or intraperitoneally. No difficulty attended injection directly into the peritoneal cavity, provided there was no distension of the abdomen. Tests for compatibility were not necessary for this procedure.

In conclusion, Dr. Stephens commented on the frequency with which parents were found to be incompatible with their own children and endorsed the remarks of previous speakers regarding the necessity for careful consideration of quantity and rate of flow when transfusing blood into patients with myocardial degeneration.

Mr. Basil Kilvington conveyed the thanks of the meeting to Mr. Hurley, Mr. Newton and Mr. Upjohn. He outlined a case in which blood transfusion had appeared to precipitate disaster. The patient was a girl in desperate condition with profound anæmia of aplastic type. She died a few hours after the transfusion and the explanation was found *post mortem* in extreme fatty degeneration of the myocardium.

Mr. Hurley, in reply, dealt first with the difficulty referred to by Dr. McArthur of obtaining donors in private and hospital practice. Up to the present he had not failed to secure a donor for a patient requiring blood transfusion. Even the most severe hæmorrhage usually permitted of at least an hour or two in which to obtain a donor from the relatives or close friends; by the use of sera of known grouping the actual testing of a donor could be carried out anywhere in a couple of minutes.

With regard to the possibility of storage of blood for use in an emergency, Robertson had evolved a method of storing sedimented corpuscles in an ice-chest in a solution of citrate containing glucose. Such stored blood obtained at the bases in Boulogne was successfully used three weeks later at a casualty clearing station in the Cambrai fighting. He knew of no other work having been carried out on these lines and, as far as he was aware, the method had not been attempted in Australia.

Reactions following blood transfusion had been variously attributed to minor degrees of incompatibility, anaphylaxis, which was a possibility following repeated transfusions, and to the use of citrate solutions other than those prepared with water distilled and freshly sterilized before use. He had not been able to consult the original paper of Hort and Penfold on the reactions following intravenous injections in general but, as far as his memory served him, they attributed these to the presence of bacterial proteins in the solutions and he had always accepted this.

He had not observed among his own patients any in whom the reaction following transfusion or other intravenous injection had been such as to occasion anxiety. He regarded those cases referred to by others as most probably due to the use of stale citrate solutions.

With reference to the question asked by Dr. Pern, Mr. Hurley said that he knew of no observations bearing on the possibility of red blood cells being more rapidly destroyed after their introduction into a patient suffering from pernicious anæmia than was the case with other patients after transfusion. On *a priori* grounds, the life of the transfused red cells might be expected to be shorter when the recipient was affected with pernicious anæmia, but he had never observed gross hæmolysis in such cases, as evidenced by jaundice and hæmoglobinuria after transfusion in the treatment of pernicious anæmia.

Mr. Upjohn remarked that where difficulty was experienced in obtaining a tested donor in cases of great urgency, the best course to pursue was to take the first person available. The chances were 50 to 1 that no catastrophe would occur.

In dealing with children with collapsed veins, he could only suggest patience and the application of hot foments to assist relaxation of the vein. This was perhaps a wiser course than increasing the head of pressure, as this might be carried to a point at which the vein would burst.

MEDICO-POLITICAL.

At a meeting of the Council of the Queensland Branch, held on September 23, 1921, it was resolved:

> That the Council regrets that the medical profession was not officially notified at an earlier date in the history of the present outbreak of plague in

Brisbane, in order that they might co-operate with the Health Department in the early recognition of suspicious cases. It is hoped that in future this procedure may be adopted in connexion with the outbreak of any important infectious diseases which may occur.

Copies of this resolution have been sent to the Home Secretary and to the Commissioner of Public Health.

Medical Societies.

BRISBANE GENERAL HOSPITAL CLINICAL SOCIETY.

A meeting of the Brisbane General Hospital Clinical Society was held at the Brisbane General Hospital on April 14, 1921, Dr. J. B. McLean in the chair.

Carcinoma of Glosso-Epiglottic Fold.

Dr. R. Graham Brown showed a man, aged 64 years, with a swelling in the side of the neck which had been noticed for three months. It was formed by a mass of hard glands the size of an apple. There was a similar mass on the left side, though considerably smaller. Laryngoscopical examination revealed an area of typical carcinoma on the right lateral wall at the level of the glosso-epiglottic fold, closely attached to the enlarged glands. On the left side there was swelling, but no ulceration. Dr. Brown considered that surgical interference was still possible.

Dr. J. B. McLean, in referring to this case, emphasized that many cases of this nature were missed because of incomplete examination. In any case of cervical glands, unless they were obviously tuberculous, an expert examination of the throat should be made. The focus was often small and amenable to treatment. If neglected, a horrible death awaited the patient.

Ununited Fracture of Humerus.

Dr. A. V. Meehan presented a case of ununited fracture of the humerus. The injury had occurred in France three years before. He had performed a two-stage operation. At the first operation the scar tissue had been excised and several foreign bodies removed. Six weeks later a tibial inlay bone graft, 17.5 cm. in length, had been inserted. There had been a large gap to fill and the arm had not been shortened. At present, eight weeks after, there was firm union, with good functional results. He attributed this to the use of an "aeroplane" splint for some time prior to the operation.

Osteo-Myelitis.

Dr. W. H. Savige showed two cases of osteo-myelitis for Dr. J. M. Thomson. A boy, aged 13 years, had a boil on the lower aspect of his leg. This had been opened and had been followed by œdema of the leg, tenderness of the tibia and enlargement of the glands in the groin. On admission, a complete fracture of the lower end of the tibia had been detected. At the operation it was seen that there was a stripping of the periosteum along the whole length of the bone. About 20 cm. of bone was gouged away and the cavity plugged with gauze. The after-treatment was continuous irrigation with eusol. The wound had healed, except for a sinus near the site of fracture. There was complete bony union and the joint movements were free.

A boy, aged 12 years, had been admitted with an abscess in the calf of the leg. X-ray examination had revealed necrosis of the lower end of the fibula. At operation the upper third of the fibula was found to be bare of periosteum. Necrosed bone was gouged out and plugging and eusol irrigation adopted. Sixteen days later, owing to a rise of temperature the leg was reopened and the external malleolus and the middle and lower thirds of the fibula removed. The patient was now progressing favourably.

Lesions of Bones.

Dr. E. S. Meyers presented a man who had had a fracture of the patella twelve years before. After a slight injury recently an ulcer had developed over the patella. Radiograms showed irregular areas of rarefaction and condensation in the bones of the joint, suggestive of specific infection. There had been no reaction to the Wassermann test.

He also showed several radiograms of bone lesions: (*i.*) Compound fracture of the femur with discharging sinus for two years. There was an abscess cavity and sclerosed bone. (*ii.*) A tibia which had been the seat of a tumour three years previously. The tumour had been chiselled out and the radiogram now showed regeneration of bone. The exact diagnosis was unknown; cystic fibroma had been suggested. (*iii.*) Old compound fracture of the femur, showing angulation. (*iv.*) Fracture of the tibia treated by plating, with sinus trouble extended over a considerable period. (*v.*) Sarcoma of the scapula.

Dr. V. McDowall showed: (*i.*) A series of radiograms, taken at intervals, of a case of osteo-myelitis of the hip, illustrating the natural method of repair. (*ii.*) Osteo-arthritis of the knee, with erosion of the articular cartilage and lipping of the bones. (*iii.*) Partial dislocation and rotation of the fifth lumbar vertebra on the sacrum. (*iv.*) Old fracture of the upper edge of the acetabulum, with partial posterior dislocation of the femur. (*v.*) Early acute infective osteo-myelitis of the head of the femur. (*vi.*) Osteo-sarcoma of the iliac bone, with involvement of the soft parts. (*vii.*) Congenital dislocation of the hip.

Dr. Meehan, in referring to the cases of compound fracture with bone cavities and sinuses, stated that he had seen good results at Liverpool following the use of bismuth-iodoform-paraffin paste and fat grafts. When he had done the same at Rosemount Military Hospital his immediate results had been good. The paste apparently enabled the skin to heal rapidly. But, later, at least 50% of the patients returned with broken down sinuses. Examination showed that the bone cavities were still present and there was no formation of mature scar tissue. With large cavities it was necessary to be radical and to follow up sinuses, even through healthy bone. It was essential to excise one wall of the cavity completely and to remove any spurs. The open bismuth-iodoform-paraffin paste method, changing the pack in fourteen days, then gave good results.

Regarding osteo-myelitis, the deformity could be prevented by proper position of the joints early in treatment. Many patients had foot-drop and inversion, which later on would absolutely prevent walking, unless an operation were done. Simple fractures, after complete reduction and correct alignment, required only simple splints. If there were any doubt and manipulations failed to do tnis, an operation was necessary.

Plates and wire were not used at Liverpool. Wire, as a rule, was too hard and brittle, besides being non-absorbable. He preferred kangaroo tendon, provided that the fractured bone was well mobilized.

Bone grafting gave the best results. An autogenous bone graft has osteo-genetic power and, even if sepsis were present, the results were still good, since there was no foreign body in the wound.

He was opposed to plating, because in 90% of cases the plate had to be removed. Metal of any sort inhibited the formation of callus. There was a great risk of sepsis and, if this supervened, the results were disastrous. In conclusion, he stated that patients who had had plating applied to their lower limbs, could never do heavy work again.

Dr. Meyers, in apologising for the absence of Dr. Meek, stated that Dr. Meek was in favour of plating and had had many successful cases. He would like to ask Dr. Meehan if, in cases of compound fracture, he would excise the damaged tissues and insert a bone graft.

Dr. Meehan, in reply, stated that he would not interfere in these cases for at least six months after everything had settled down.

Dr. C. J. Weedon considered that Dr. Meehan was rather pessimistic about the removal of plates. He had removed them occasionally in fractures of superficial bones, but not of deep ones. In any case, the operation was a trivial one and if the result was good, that was the main thing. He regarded the plate as a temporary splint, which gave good apposition and union.

Dr. D. A. Cameron stated that the main point in the treatment of fractures was to get good alignment. Fractures in children were different from those in adults.

Operative interference in the former was bad. In adults there was a wave of enthusiasm for operation. He considered that operation was performed too early. Frequently there was good union after two years. With ununited fractures the results of bone grafting were good, if the operation were performed more than six months after complete healing, but very bad if done earlier. He wondered if many now used the older methods of rubbing the ends of the bones together or drilling them.

Dr. E. Culpin asked if the method of filling the cavity with blood clot and suturing the skin over it was used in cases of osteo-myelitis. This was recognized in mastoid surgery.

Dr. J. B. McLean stated that plating had been done more often than grafting at the Brisbane General Hospital and had been moderately successful. He admitted that in many cases removal of the plates was needed. If sepsis intervened, the results were deplorable and sinuses persisted for years. Before the days of plating and grafting for ununited fractures, good results had been obtained from the injection of iodine between the ends of the bone. He had not seen such good results from rubbing the ends of the bones.

Pseudo-Angina.

Dr. Eustace Russell presented the history of a girl, aged 26 years, who had experienced a sudden pain in the left side of the chest, radiating down the left arm to the elbow and the inner side of the little finger. The attack was so severe that she thought she would die. It had lasted about five minutes and she could not speak. After the attack she had felt weak and cold. She was a well-built girl, just out from England. There were no abnormal signs in the respiratory system. The systolic blood pressure was 98 mm. of mercury. There was no tenderness in the abdomen. Hyperalgesia was present over the left pectoral and inner side of the arm of the same side. He had diagnosed the case as one of pseudo or toxic angina. True angina was not common in women and seldom occurred in persons under fifty. The false type was common at this period and was due to some focus, such as a chronic infection of the antrum or appendix. The focus in this case had not been discovered and he would further refer to this case at the next meeting.

Dr. S. F. McDonald considered that the affection was a pure functional neurosis. Freud had described it in the anxiety state. These patients had palpitations and dreams which had for their basis unsatisfied sexual excitement. The condition was seen in cases where masturbation had been stopped suddenly, at the climacteric and in old men with enlarged prostates. The treatment was very difficult, for the blunt truth could not be told to the patient. They had to realize it for themselves. He did not deny that toxæmia played a large part in many cases and that a focus should be searched for in the teeth, tonsils, appendix or intestinal stasis.

Dr. Meyers agreed with Dr. McDonald regarding these neuroses. Many alleged heart attacks in persons who had lived a long time since their onset, were purely nervous and often due to domestic troubles.

Dr. Russell, in reply, did not agree with the neurotic basis for pseudo-angina. He was very sceptical of pure neuroses. Careful examination should reveal some focus. This patient had a well-marked angina, which was unusual in a first attack. Pseudo-angina was generally mild and the pain præcordial, with very rare extension down to the fingers.

Aortic Aneurysm.

Dr. Russell also presented a man, aged 58 years, who had complained of dyspnœa, especially at night, and cough for the past eighteen months. There was no sputum. Lately he had developed aphonia. His general condition was poor; the jugular veins were dilated, but there was no dysphagia. There was a heaving, expansile pulsation over the whole cardiac area, with a diffuse apex beat and a systolic thrill on palpation. The aortic second sound was accentuated; no bruits were present. Radiographic examination disclosed an aneurysm of the ascending aorta. No reaction to the Wassermann test was given. He was placed on the Tufnell regime and given potassium iodide. A great improvement had taken place in the last few weeks.

Dr. Meyers congratulated Dr. Russell on the result in this case. He had originally sent the patient to hospital for a tracheotomy because he was so ill.

Dr. D. A. Cameron inquired as to the present-day views on the treatment of aneurysm by injections of gelatine. He referred to a man whom, after this had been done, he had seen on active service.

Dr. Russell, in reply, stated that gelatine had fallen into disuse after the occurrence of several cases of tetanus. He had seen it used, but the results had not been very striking.

Cardiac Lesions.

Dr. Russell gave the history of a woman, aged 53 years, with dyspnœa on exertion, rapid, irregular pulse and œdema of the feet, legs and abdomen. The heart was dilated; the apex beat was in the seventh interspace and the superficial cardiac dulness was markedly increased to the left. There was a loud systolic bruit at the apex. Pulse tracings showed marked auricular fibrillation. She had greatly improved under treatment, but the prognosis was not good.

Dr. E. S. Meyers showed a young man suffering from dyspnœa and vertigo. He had had rheumatism in childhood. The apex was in the nipple line. There was a systolic bruit at the apex and a systolic and diastolic murmur at the base. The systolic blood pressure was 160 mm. of mercury and the diastolic 120 mm..

THE MEDICAL SCIENCES CLUB.

A meeting of the Medical Sciences Club of South Australia was held at the University of Adelaide on July 1, 1921.

Professor T. Brailsford Robertson described the results of a series of experiments upon the propagation of *Infusoria* from isolated individuals, singly or in pairs. The multiplication-rate of isolated individuals of *Enchelys farcimen* decreased with increasing age of the parent culture. This decrease was manifest whether the selected individual were isolated into fresh hay infusion or into an infusion already densely inhabited by bacteria, although in the latter case the rate of multiplication was much higher. The food of *Infusoria* consists of bacteria, but the stimulating effect of "bacterized" infusions upon multiplication-rate was not due to the bacteria themselves, because it was equally evident in infusions which, after "bacterization," had been filtered through a Berkefelt filter and were free from bacteria. The stimulation evidently depended upon some soluble substance secreted by the bacteria into the medium. The substance was not destroyed by boiling and it was not volatile.

If two *Infusoria* were isolated together in the same drop of culture medium, not twice, but four, six or eight times as many individuals were produced in 24 hours as from a single individual. This was not due to conjugation of the pair of individuals originally isolated, for conjugation did not occur, and in cases in which conjugaton was induced by washing the *Infusoria* in distilled water, no acceleration, but rather retardation of reproductive rate ensued. The accelerated effect was due to mutual contiguity of the cells and depended upon the presence in the culture medium of soluble products of bacterial activity. The substance produced by the bacteria which enabled this effect to occur, was thermostable and non-volatile and was probably identical with the substance which stimulated the reproduction of single individuals in "bacterized" infusions and with the substance described by Williams and by Funk which accelerated the multiplication of yeast cells. The auto-accelerative effect or progressive increase in multiplication-rate which was observed in all congeries of cells, was possibly attributable to similar factors and the possibility was indicated that a food-accessory existed which was essential, not because of any direct action upon the multiplication of animal cells, but because it enabled these cells to produce a substance in excess which diffused into the surrounding media and stimulated the reproduction of adjacent cells.

Dr. L. B. Bull suggested that the use of dead, washed bacteria as a source of food would clear up the question as to whether the substance produced by bacteria, which enabled mutual acceleration to occur, resided in their cell-

substance or was merely excreted by them into the surrounding medium.

PROFESSOR E. H. RENNIE suggested that the subjection of the "bacterized" infusions to ultra-filtration might throw light upon the nature of the auto-accelerator.

DR. C. T. TURNER suggested that these phenomena might throw a light upon the growth of tumours. If the cells of the tumour mutually accelerated each other's multiplication and retardative influences due to endocrine organs were removed, the rapid growth of some tumours would be explicable.

PROFESSOR E. H. RENNIE drew the attention of the meeting to an article recently published in the *Proceedings of the Royal Society of Medicine* by R. L. McKenzie Wallace and Dr. G. Langton Hewer to the effect that absolutely pure ether was not an anæsthetic, the anæsthetic effects of commercial ether being due to certain as yet unidentified higher ketones.

DR. L. B. BULL drew attention to an article in the *British Medical Journal* of April 30, 1921, entitled "Acute Benign Lympho-blastosis." He reported that cases similar to those described in the article had not infrequently been observed in Adelaide. In one recent instance a child of eight years of age was supposed to have had measles and not to have made complete recovery. There was enlargement of the glands of the neck and axilla. The blood picture suggested a mild degree of acute lymphoid leuchæmia. All evidence of leuchæmia disappeared within a few weeks.

Public Health.

PLAGUE IN BRISBANE.

A MEMORANDUM has been issued from the Department of Health for the Commonwealth of Australia on September 21, 1921, dealing with the situation in regard to the outbreak of plague in Brisbane. In the following the more important details are reproduced:

On September 13, 1921, the Commissioner of Public Health of the State of Queensland notified the Director-General of Health for the Commonwealth that a death from plague had occurred in Brisbane on August 23, 1921, the diagnosis having been confirmed by bacteriological methods. A rodent crusade had been initiated and up to that date smears from the spleens of five rats from two produce stores contained *Bacillus pestis*. Dead rats had been found in each store.

Instructions were issued to the Chief Quarantine Officer at Brisbane to initiate a close supervision of outward rail traffic in connexion with certain classes of goods and of all outward sea traffic. Bills of Health were endorsed with information concerning the outbreak. The Health Department of Queensland was offered facilities for the accommodation of any further patients at the Lytton Quarantine Station.

On September 14, 1921, the Chief Quarantine Officers at Fremantle, Adelaide, Melbourne, Sydney and Hobart were instructed to detain and examine every vessel from Brisbane. The recognized methods for dealing with rat-infested goods were prescribed.

On September 15, 1921, the Department of Health of Queensland agreed to supply full information regarding epizootic developments in Brisbane. We may interpose in this place the statement that the Department has kindly forwarded to us copies of these official reports.

In the meantime, notifications of the occurrence of plague in Brisbane were cabled to all overseas countries concerned.

On September 16, 1921, it was reported that an infected rat had been found in some stables in the Valley area of North Brisbane, over a mile from the nearest previously infected locality. Another infected rat was found in Roma Street. The officers of the Department of Health for the Commonwealth supervised and directed the control of rail-borne produce which had been initiated by the State Department.

On September 17, 1921, a proclamation was published in the *Commonwealth of Australia Gazette*, declaring the State of Queensland infected with plague. On this day further infected rats were found in Roma Street.

On September 18, 1921, it was reported that seven infected rats had been found in various localities, bringing the total number up to 17.

On September 19, 1921, instructions were issued for the inoculation against plague of all the members of the staff engaged in boarding and inspection work in each State. Arrangements were made for the *post mortem* examination of all rats found dead or killed by fumigation and for the bacteriological investigation of suspected infections in rats.

On the same day the *Wyreema* arrived at Sydney from North Queensland, having sailed from Brisbane on September 17, 1921. Six dead rats were found in one of the holds and one of these was found to be infected with plague. The other five were too decomposed for bacteriological examination. The vessel was put into the stream for fumigation before further discharge of cargo. All persons on board at the time of arrival and subsequently were placed under a seven days' surveillance. The New South Wales health authorities were immediately advised of the facts.

The discovery of plague-infected rats and of dead rats among the cargo of the *Wyreema* and the report of an unusual mortality among rats at Townsville indicated:

(*i.*) That the *Wyreema* was infected on her voyage northwards before the Commonwealth quarantine supervision commenced. The condition of putrescence of the rats excluded the possibility of infection of rats during the journey southwards, two days being insufficient time for infection, illness, death and putrescence of rats.

(*ii.*) The distribution of plague infection over a wider area in Brisbane than had hitherto been known.

(*iii.*) The necessity for an organized system of control of trade for the prevention of migration of rats, in order to protect other States.

This discovery confirmed the wisdom of the measures taken and showed clearly how unwise had been the policy of concealment adopted by the State authorities.

The history of plague in all countries renders it certain that the risk to the other States from Queensland will continue for many months. It is therefore necessary that any system of control, while being effective for the control of rat migration, shall, at the same time, permit as near an approach to normal trade intercourse as is consistent with safety. The known facts in relation to plague show that, unless pneumonic plague developes, the human factor is not important. It is, therefore, unnecessary to institute any system of inter-State surveillance or border inspection and no good purpose under the present conditions will be served by the control of railway human traffic.

The medical inspection of persons on vessels at the various ports in Australia until the completion of the outward voyage from Brisbane is necessary, in order to obtain an index of possible plague epidemics among rats on vessels. In view of the natural history of the disease, it is not considered that surveillance of passengers travelling either by land or sea would yield any valuable results in any way proportionate to the extensive organization which would be required.

Full information is contained in the memorandum in regard to the form of supervision required in the case of various classes of goods. The object of the control would be to keep inter-State vessels plying to and from Queensland as nearly rat-free as possible and to prevent infected rats from gaining access to ships from the wharves in Brisbane.

In order to cover the risk resulting from the concealment by the State authorities of the presence of plague, all vessels which were in the Brisbane area during the period before the Quarantine supervision was in force, will be unloaded into lighters and fumigated before coming along side.

On September 19, 1921, the quarantine officer at Townsville reported the presence of dead rats on the *Kuranda*. The result of the bacteriological investigation was not available at the time of the issue of the memorandum. On the following day an infected rat was found at Hamilton, two miles outside the previously infected area.

On September 21, 1921, a further case of plague in a human being was notified and the patient died.

Obituary.

ALFRED NICHOLAS CHENHALL.

As announced in our issue of last week, Alfred Nicholas Chenhall died on September 20, 1921. His illness probably began during a period of terrible anxiety in the latter half of 1914. He was touring in Germany when war broke out and he experienced difficulty in getting the members of his family out of Berlin. On his arrival in London he became very ill and, although he has performed many very valuable services since that time, he did not regain his former good health.

Alfred Nicholas Chenhall was born on February 23, 1869, near Chiltern, in Victoria. He was educated at the Beechworth Grammar School, from whence he matriculated. He entered Ormond College of the University of Melbourne with a very fine record of his school life. A little later he gained the Queen's College Scholarship and transferred his residence to that College. In 1895 he graduated in medicine and surgery. He was then appointed Medical Officer at the Women's Hospital, Melbourne. Later he served in a similar capacity for one year at the Children's Hospital and then returned to the Women's Hospital, where he occupied a senior position on the resident staff. In 1897 he became attached to the Ballaarat Hospital and served there for two years. After leaving Ballaarat he started practice in Corowa, in New South Wales, but moved a few months later to Stanmore, a suburb of Sydney, to succeed his brother, Dr. William Thomas Chenhall, in a very extensive practice. He conducted this practice for over twenty-one years with signal success. He was a very sound practitioner and was assiduous in his reading of current medical literature. He had an exceptionally retentive memory and a good grasp of the many complex problems which make up a general practitioner's store of knowledge. No detail was too insignificant for his attention. His was essentially a mind adapted for the practical application of clinical and pathological truths to the treatment of disease in his patients.

When war broke out and he and his family escaped from Berlin, he was unable to volunteer for active service on account of the precarious condition of his health. Later, when he returned to Sydney, he offered his services in the Australian Army Medical Corps Reserve and was gazetted as Honorary Captain on April 22, 1916. He was employed for a long period at the Victoria Barracks, Sydney, and later he rendered service at the Anzac Buffet. The strenuousness of his activities in those days, during which he continued to attend to his very busy visiting practice, gradually increased the cardiac lesion which ultimately terminated his life.

He had a true Australian's natural love for sport. In earlier life he played a good game of football; later he interested himself in rowing. He was the staunch friend and idol of the boys at Newington College, where his son was being educated. He loved them and they loved him. One of his proudest days was when his son stroked the Newington College crew to victory in the Great Public Schools Boat Race in 1920. The affection displayed without restraint by the schoolboys was no greater than that felt for him by a very large number of his patients. His was a singularly useful life.

HARRY MARTIN LIGHTOLLER.

We regret to announce the death of Dr. Harry Martin Lightoller, of Brisbane, which occurred on September 23, 1921. A notice of his career will be published in a subsequent issue.

Correspondence.

THE ROUTINE REPORTING OF CASES SENT TO PUBLIC HOSPITALS.

Sir: My experience in a suburban practice has convinced me that a very great want exists in the facilities for following up cases which are sent to public hospitals. They are returned to their local doctor's care, often at the earliest moment that their illness will allow, without the patient or the doctor being given any definite information as to his condition, the treatment in hospital or the after-treatment recommended by the honorary in charge. If the local doctor is sufficiently enthusiastic to make inquiries by telephone or by letter (a visit to the hospital being usually impossible), a great deal of time and trouble is involved, which neither he nor the resident can well spare, and so, too often, the information is not obtained and the patient's interests suffer accordingly. A system which would obviate this difficulty would be of great advantage to the patient and to the practitioner and would do away with one of the most potent causes of isolation of the general practitioner and of his so frequently settling into a groove of routine work in which he does not advance with the advance of general knowledge. My suggestion is that a system be instituted whereby cases sent by private practitioners to public hospitals for in-patient or out-patient treatment be reported on by the hospital staff to the practitioner after a suitable interval.

In detail, I suggest that the practitioner send with his usual letter accompanying the patient (which should be a concise clinical history of the case), an envelope stamped and addressed to himself and containing a form to be filled in by the resident or other member of the hospital staff, giving a brief summary of the hospital diagnosis, treatment, progress, prognosis and after-treatment recommended on discharge and also X-ray, pathological, operative and *post mortem* findings, if any.

If thought desirable, the onus and expense of providing the necessary forms (which should be uniform for each State) could rest on the practitioner sending in the case.

I have approached the Council of the Victorian Branch of the British Medical Association, suggesting that action be taken in this direction.

Yours, etc.,

A. P. Derham, M.B., B.S..

261, High Street, Preston, Victoria,
September 24, 1921.

IS ETHYL CHLORIDE SAFE?

A Correction.

Sir: In a letter published in The Medical Journal of Australia of September 24, 1921, I wished to convey that the toxicity of 10% concentration of ethyl chloride vapour in air is approximately that of 3.5% concentration of chloroform vapour. Unfortunately, the decimal point has been omitted therefrom, making it read 35% concentration, which is obviously absurd. Will you oblige by publishing this as a correction?

Yours, etc.,

E. H. Embley, M.D.,
Consulting Anæsthetist to the Melbourne Hospital.

Seville, Victoria,
September 28, 1921.

AN APPEAL FOR THE UNIVERSITY OF BRISTOL.

The University of Bristol is sadly in need of money to cope with the ever-increasing demands of modern technical education. The great home of learning of the west of England has sent its students to every part of the Empire. Now, in the time of need, a powerful appeal committee is striving to address every friend of the University and to induce them to contribute to the scheme which has as its ultimate obect the adequate equipment of what the committee terms the power stations of mind. An interesting booklet, containing information concerning the growth, development and aims of this university, has recently reached us. Recognizing that the medical school at Bristol and its professors and teachers are well known to many medical practitioners in Australia, we do not hesitate in recommending this appeal to the best consideration of our readers. The group scheme involves the collection of a

million pounds. Subscribers will be included in one of nineteen groups, according to the amount of their contributions. The Appeal Director is A. F. Shepherd, Esq., University Appeal Offices, 51, Corn Street, Bristol.

A HEALTH WEEK FOR SYDNEY.

Drs. W. G. Armstrong, Harvey Sutton and J. S. Purdy have started a movement in Sydney for the holding of a health week, designed after the pattern of the Health Week of Great Britain, which was instituted in 1912 by the Agenda Club and revived after the termination of the war. Various prominent citizens and several voluntary societies, having for their object the furtherance of one or more branches of hygiene and social endeavour, have associated themselves with the founders of the proposal. The underlying idea of a health week is to direct public attention to the various problems connected with the public health and to force the people during a whole week to realize the waste resulting from preventible disease and the sentimental and economic value of the preservation of the health of the community. It has been decided to hold the "Health Week" from October 16 to October 22, 1921.

THE STEWART LECTURES.

The Stewart Lectures are delivered at the University of Melbourne every three years. The present series will be given by Professor R. J. A. Berry on November 14, 18 and 21, 1921, in the Assembly Hall, Collins Street, Melbourne. The general title of the series is "The Modern Psychology." The first lecture will be on the evolution of the brain as a physical organ of mind; the second will be on brain growth as affected by education; the third will be on the psychological failures of life.

Books Received.

LECTURES ON FORENSIC MEDICINE, by C. H. Mollison, M.B., M.R.C.S.; 1921. Melbourne: W. Ramsay; Demy 8vo., pp. 136.

Medical Appointments.

It is announced that Dr. R. J. Silverton (B.M.A.) has been appointed Honorary Urologist to the Coast Hospital, New South Wales.

* * * *

Dr. Arthur J. Mackenzie (B.M.A.) has been appointed Government Medical Officer at Glen Innes, New South Wales, in place of the late Dr. John Mackenzie.

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Dr. C. W. Purves (B.M.A.) has been appointed Government Medical Officer at Esk, Queensland.

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Under the provisions of *The Health Acts, 1900 to 1917*, of Queensland, Dr. Geoffrey H. Vernon (B.M.A.) has been appointed Health Officer at Thursday Island.

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The re-appointment of Dr. F. S. Hone (B.M.A.) as Honorary Physician and of Dr. W. C. Sangster (B.M.A.) as Honorary Clinical Assistant to the Ear, Nose and Throat Department of the Adelaide Hospital is announced in *The South Australian Government Gazette*.

NOTICE TO AUTHORS.

In July, 1919, the Directors of the Australasian Medical Publishing Company, Limited, determined that the cost of preparing blocks for the illustration of articles published in The Medical Journal of Australia should be borne by the Company. Prior to this date the authors were required to pay for the blocks. We have the accumulation of seven years in our keeping. Authors who require the blocks for which they have paid, are requested to apply for them as soon as possible. It is proposed to destroy all unclaimed blocks on November 1, 1921.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
New South Wales: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
Victoria: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
Queensland: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
South Australia: Honorary Secretary, 3, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
Western Australia: Honorary Secretary, 6, Bank of New South Wales Chambers, St. George's Terrace, Perth	All Contract Practice Appointments in Western Australia
New Zealand (Wellington Division): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

Oct. 8.—New South Wales Branch, B.M.A.: Annual Meeting of Delegates of Local Associations with the Council (Second Day).
Oct. 11.—Tasmanian Branch, B.M.A..
Oct. 11.—New South Wales Branch, B.M.A.: Ethics Committee.
Oct. 12.—Melbourne Pædiatric Society (Victoria).
Oct. 13.—Victorian Branch, B.M.A.: Council.
Oct. 13.—Brisbane Hospital Clinical Society.
Oct. 14.—New South Wales Branch, B.M.A.: Clinical.
Oct. 14.—Queensland Branch, B.M.A.: Council.
Oct. 14.—South Australian Branch, B.M.A.: Council.
Oct. 18.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Oct. 19.—Western Australian Branch, B.M.A..
Oct. 20.—Western Medical Association (New South Wales).
Oct. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
Oct. 26.—Victorian Branch, B.M.A.: Council.
Oct. 27.—South Australian Branch, B.M.A..
Oct. 28.—New South Wales Branch, B.M.A..

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be stated.

All communications should be addressed to "The Editor," The Medical Journal of Australia, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)